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WATERSHED PLAN
AND
ENVIRONMENTAL IMPACT STATEMENT
FOR
WATERSHED PROTECTION AND FLOOD PREVENTION

MUD CREEK

CULLMAN COUNTY, ALABAMA

USDA-SCS-FORT WORTH, TEXAS 1976

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FINAL PLAN AND FINAL ENVIRONMENTAL IMPACT STATEMENT

MUD CREEK WATERSHED

Cullman County, Alabama

Prepared Under the Authority of the Watershed Protection and Flood Prevention Act (Public Law 566, 83rd Congress, 68 Stat. 666), as amended, and in accordance with the National Environmental Policy Act of 1969, Section 102 (2)(C) Public Law 91-190.

Prepared By

Cullman County Soil and Water Conservation District

Cullman County Commission

City of Hanceville

With Assistance By

U. S. Department of Agriculture
Soil Conservation Service

U. S. Department of Agriculture
Forest Service

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PART I

FINAL PLAN

INTRODUCTION

The plan, Part I of this document, has been briefed to avoid excessive duplication with information contained in the environmental impact section. Part II should be consulted for detailed information concerning objectives, planned measures, impacts, etc.

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WATERSHED PLAN AGREEMENT

between the

CULLMAN COUNTY SOIL AND WATER CONSERVATION DISTRICT

CULLMAN COUNTY COMMISSION

CITY OF HANCEVILLE

(hereinafter referred to as the Sponsoring Local Organization)

STATE OF ALABAMA

and the

SOIL CONSERVATION SERVICE
UNITED STATES DEPARTMENT OF AGRICULTURE

(hereinafter referred to as the Service)

Whereas, application has heretofore been made to the Secretary of Agriculture by the Sponsoring Local Organization for assistance in preparing a plan for works of improvement for the Mud Creek Watershed, State of Alabama, under the authority of the Watershed Protection and Flood Prevention Act (P. L. 566, 83rd Congress; 68 Stat. 666), as amended; and

Whereas, the responsibility for administration of the Watershed Protection and Flood Prevention Act, as amended, has been assigned by the Secretary of Agriculture to the Service; and

Whereas, there has been developed through the cooperative efforts of the Sponsoring Local Organization and the Service a mutually satisfactory plan for works of improvement for the Mud Creek Watershed, State of Alabama, hereinafter referred to as the watershed plan agreement, which plan is annexed to and made a part of this agreement;

Now, therefore, in view of the foregoing considerations, the Sponsoring Local Organization and the Secretary of Agriculture, through the Service, hereby agree on the watershed plan, and further agree that works of improvement as set forth in said plan can be installed in about five years.

It is mutually agreed that in installing and operating and maintaining the works of improvement substantially in accordance with the terms, conditions, and stipulations provided for in the watershed plan:

1. The Sponsoring Local Organization will acquire, with other than PL-566 funds, such land rights as will be needed in connection with the works of improvement. (Estimated Cost $18,700).

2. The Sponsoring Local Organization assures that comparable replacement dwellings will be available for individuals and persons displaced from dwellings, and will provide relocation assistance advisory services and relocation assistance, make the relocation payments to displaced persons, and otherwise comply with the real property acquisition policies contained in the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Public Law 91-646, 84 Stat. 1894) effective as of January 2, 1971, and the Regulations issued by the Secretary of Agriculture pursuant thereto. The costs of relocation payments will be shared by the Sponsoring Local Organization and the Service as follows:

ITEM	SPONSORING LOCAL ORGANIZATION (Percent)	SERVICE (Percent)	ESTIMATED RELOCATION PAYMENT COSTS (Dollars)
Relocation Payments	33.9	66.1	0.0 1/

3. The Sponsoring Local Organization will acquire or provide assurance that landowners or water users have acquired such water rights pursuant to state law as may be needed in the installation and operation of the works of improvement.

4. The percentages of construction costs of structural measures to be paid by the Sponsoring Local Organization and by the Service are as follows:

WORKS OF IMPROVEMENT	SPONSORING LOCAL ORGANIZATION (Percent)	SERVICE (Percent)	ESTIMATED CONSTRUCTION COST (Dollars)
Channel Work	0.0	100.0	241,400

1/ Investigation has disclosed that under present conditions the project measures will not result in the displacement of any person, business, or farm operation. However, if relocations become necessary, relocation payments will be cost-shared in accordance with the percentages shown.

4A. The percentages of fire suppression equipment cost to be paid by the Sponsoring Local Organizations and by the Service are as follows:

WORKS OF IMPROVEMENT	SPONSORING LOCAL ORGANIZATIONS (Percent)	SERVICE (Percent)	ESTIMATED COST (Dollars)
Fire Suppression Equipment	50	50	5,200

5. The percentages of the engineering costs to be borne by the Sponsoring Local Organization and the Service are as follows:

WORKS OF IMPROVEMENT	SPONSORING LOCAL ORGANIZATION (Percent)	SERVICE (Percent)	ESTIMATED ENGINEERING COST (Dollars)
Channel Work	0	100	19,000

6. The Sponsoring Local Organization and the Service will each bear the costs of Project Administration which it incurs, estimated to be $2,000 and $36,000 respectively.

7. The Sponsoring Local Organization will provide assistance to landowners and operators to assure the installation of the land treatment measures shown in the watershed plan.

8. The Sponsoring Local Organization will encourage landowners and operators to operate and maintain the land treatment measures for the protection and improvement of the watershed.

9. The Sponsoring Local Organization will be responsible for the operation and maintenance of the structural works of improvement by actually performing the work or arranging for such work in accordance with agreements to be entered into prior to issuing invitations to bid for construction work.

10. The costs shown in this agreement represent preliminary estimates. In finally determining the costs to be borne by the parties hereto, the actual costs incurred in the installation of works of improvement will be used.

11. This agreement is not a fund obligating document. Financial and other assistance to be furnished by the Service in carrying out the watershed plan is contingent on the availability of appropriations for this purpose.

A separate agreement will be entered into between the Service and the Sponsoring Local Organization before either party initiates work involving funds of the other party. Such agreements will set forth in detail the financial and working arrangements and other conditions that are applicable to the specific works of improvement.

12. The watershed plan may be amended or revised, and this agreement may be modified or terminated only by mutual agreement of the parties hereto except for cause. The Service may terminate financial and other assistance in whole, or in part, at any time whenever it is determined that the Sponsoring Local Organization has failed to comply with the conditions of this agreement. The Service shall promptly notify the Sponsoring Local Organization in writing of the termination and the reasons for the termination, together with the effective date. Payments made to the Sponsoring Local Organization or recoveries by the Service under projects terminated for cause shall be in accord with the legal rights and liabilities of the parties.

    An amendment to incorporate changes affecting one specific structural measure may be made by mutual agreement between the Service and the sponsors having specific responsibilities for the particular structural measure involved.

13. No member of or delegate to Congress, or resident commissioner, shall be admitted to any share or part of this agreement, or to any benefit that may arise therefrom; but this provision shall not be construed to extend to this agreement if made with a corporation for its general benefit.

14. The program conducted will be in compliance with all requirements respecting nondiscrimination as contained in the Civil Rights Act of 1964, as amended, and the regulations of the Secretary of Agriculture (7 C.F.R. 15.1-12), which provide that no person in the United States shall, on the ground of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination under any activity receiving federal financial assistance.

15. This agreement will not become effective until the Service has issued a notification of approval and authorizes assistance.

Cullman County Soil and Water Conservation Distr
Cullman County Soil and Water Conservation District

By E. L. Gibbs

Title Chairman

Address Hanceville, Al. 35077

Date March 29, 1976

The signing of this agreement was authorized by a resolution of the governing body of the Cullman County Soil and Water Conservation District
Cullman County Soil and Water Conservation District

adopted at a meeting held on March 8, 1976.

Edwin Carter
(Secretary) Cullman County Soil and Water Conservation District

Address Route #3 Box 434 Cullman, Al 35055

Date March 31, 1976

Cullman County Commission
Cullman County Commission

By R. L. Harbison

Title Chairman Cullman Co. Commission

Address P.O. Box 698 Cullman, Ala 35055

Date March 31, 1976

The signing of this agreement was authorized by a resolution of the governing body of the Cullman County Commission
Cullman County Commission

adopted at a meeting held on March 8, 1976.

Lucille Gann
(Secretary) Cullman County Commission

Address P.O. Box 698 Cullman, Al 35055

Date March 31, 1976

City of Hanceville
City of Hanceville

By Nelson Bacon Sr

Title Mayor

Address P-O Box 264, Hanceville 350

Date March 29, 1976

The signing of this agreement was authorized by a resolution of the governing body of the City of Hanceville
City of Hanceville

adopted at a meeting held on July 17, 1969

Aileen Whitfield, Clerk
City of Hanceville

Address Box 343, Hanceville, Ala

Date March 29, 1976

Appropriate and careful consideration has been given to the environmental statement prepared for this project and to the environmental aspects thereof.

Soil Conservation Service
United States Department of Agriculture

By W B Ziegle
(State Conservationist)

Date APR 2 1976

FINAL PLAN

MUD CREEK WATERSHED

CULLMAN COUNTY, ALABAMA

SUMMARY

Mud Creek Watershed encompasses 11,750 acres located in the south-central portion of Cullman County, Alabama.

The local sponsoring organizations are: the Cullman County Soil and Water Conservation District, the Cullman County Commission, and the City of Hanceville.

Mud Creek Watershed Plan is a project for watershed protection and flood prevention through conservation land treatment and about 4.7 miles of channel work. Conservation land treatment will be installed throughout the watershed within a 5-year period at a total cost of $214,200. The planned channel work, as shown on the project map, will be installed within a 2-year period at a total cost of $317,100. Total project installation cost is estimated to be $531,300.

Accelerated conservation land treatment will adequately protect much of the watershed area and will reduce sediment yield by 33 percent. Land treatment will reduce runoff by an estimated 5 percent and will enhance watershed aesthetic qualities.

Channel work will reduce flooding on 600 acres of flood plain land and will encourage more favorable land use. Channels are designed to contain runoff from a 0.5 year, 24 hour rainfall.

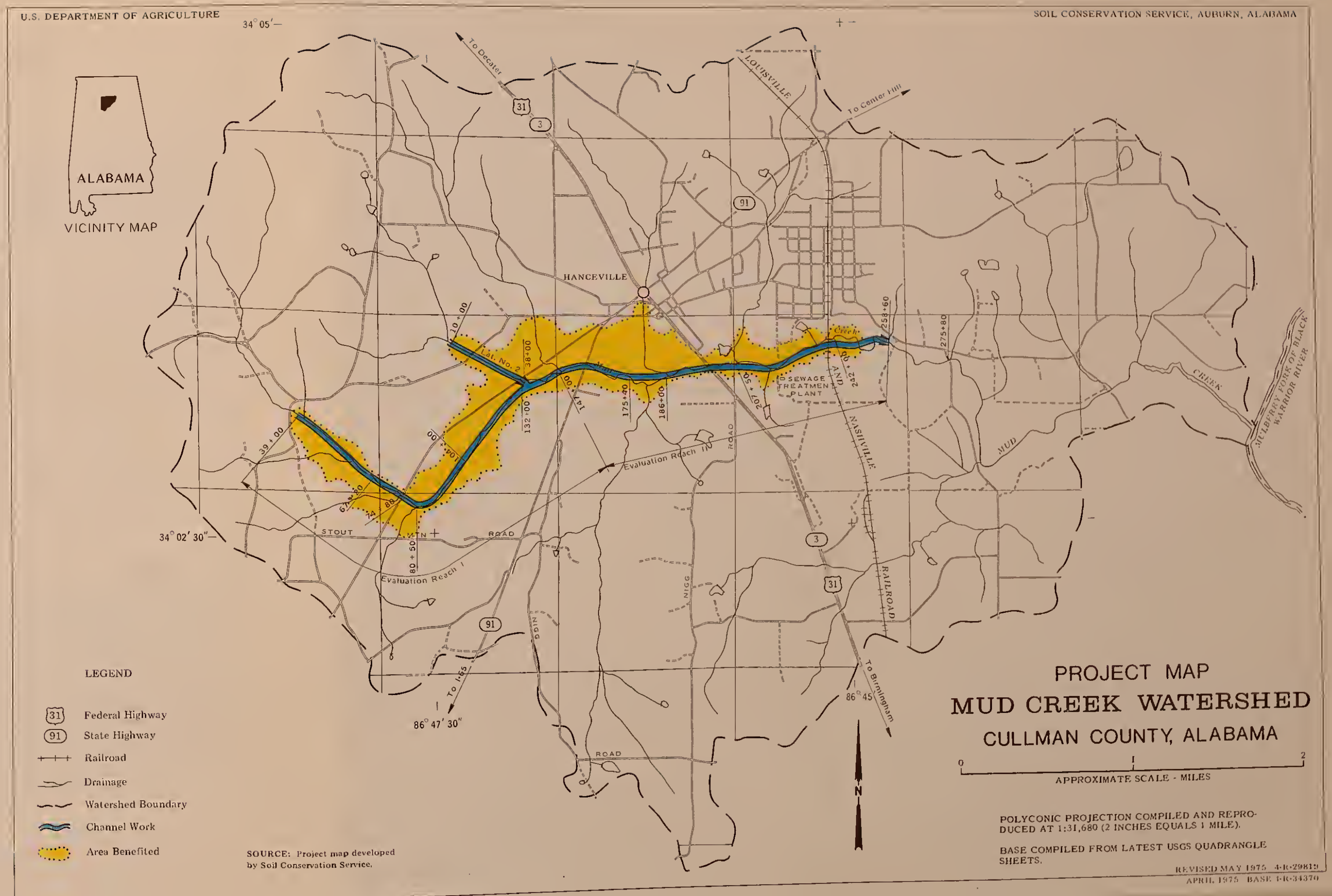
Total estimated annual project benefits derived from the installation of project measures are estimated to be $26,900. Average annual cost based on 5 7/8 percent interest is $20,200, giving a benefit-cost ratio of 1.3:1.0.

Conservation land treatment measures will be installed, financed, and maintained by the land owners. Accelerated technical assistance will be provided by the Soil Conservation Service and the Alabama Forestry Commission in cooperation with the U. S. Forest Service using PL-566 funds. The channel work will be financed by PL-566 and other funds and will be maintained by the local sponsoring organizations. An inspection program will be performed to assure the proper maintenance of all structural measures.

PLANNED MEASURES

Conservation plans will be developed on individual farms detailing the land treatment measures needed on that particular farm. These plans are developed in an effort to utilize each acre of land within its capabilities and treat it according to its needs. Conservation land treatment measures are planned throughout the watershed and will result in 200 acres of cropland, 900 acres of pastureland, 300 acres of forest land, and 20 acres of wildlife land being adequately treated. Measures planned consist of conservation croping systems, contour farming, crop residue management, drainage mains and laterals, pasture and hayland management, pasture and hayland planting, forest stand improvement treatment, forest stand improvement cutting, wildlife wetland habitat management, wildlife upland habitat management, field borders, grassed waterways, land smoothing, ponds, and terraces.

Channel work is planned for 4.7 miles of the stream. Channel work will consist of earth excavation to provide a greater capacity stream channel. Streamflow within the 4.7 miles of proposed channel work is 2.6 miles ephemeral, 1.1 miles intermittent, and 1.0 mile perennial.


U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE, AUBURN, ALABAMA
ALABAMA
VICINITY MAP
34° 05′
34° 02′ 30″
86° 47′ 30″
86° 45′
To Decater
To Center Hill
LOUISVILLE
HANCEVILLE
Lat. No. 2
Creek
SEWAGE TREATMENT PLANT
NASHVILLE
RAILROAD
MUD
CREEK
MULBERRY FORK OF BLACK WARRIOR RIVER
Evaluation Reach II
Evaluation Reach I
STOUT
MTN
ROAD
NIGG
To I-65
To Birmingham
10+00
38+00
132+00
147+00
175+40
186+00
207+50
242+00
258+60
275+80
39+00
104+00
67+20
74+80
80+50
31
3
91
N
LEGEND
Federal Highway
State Highway
Railroad
Drainage
Watershed Boundary
Channel Work
Area Benefited
SOURCE: Project map developed by Soil Conservation Service.
PROJECT MAP
MUD CREEK WATERSHED
CULLMAN COUNTY, ALABAMA
0
1
2
APPROXIMATE SCALE - MILES
POLYCONIC PROJECTION COMPILED AND REPRODUCED AT 1:31,680 (2 INCHES EQUALS 1 MILE).
BASE COMPILED FROM LATEST USGS QUADRANGLE SHEETS.
REVISED MAY 1975 4-R-29819
APRIL 1975 BASE 4-R-34370

INSTALLATION COSTS - MONETARY

LAND TREATMENT

The installation cost of conservation land treatment measures on private farmland will be borne by the individual landowners or operators, with technical assistance being provided by the Soil Conservation Service, operating through the Cullman County Soil and Water Conservation District and the Alabama Forestry Commission in cooperation with the U. S. Forest Service. The PL-566 cost for installing the land treatment measures is for the technical assistance provided and fire control equipment.

Cropland and Pastureland

Public Law 566 will provide $36,000 to accelerate technical assistance for planning and installing the proposed conservation land treatment measures on cropland and pastureland. The Soil Conservation Service will provide an additional $15,000 in technical assistance under the ongoing program.

The total estimated installation costs of the planned conservation land treatment measures displayed in table 1 and summarized below are:

	PL-566	OTHER	TOTAL
Conservation land treatment	$54,800	$159,400	$214,200

Forest Land

The estimated cost of the forest land treatment program is $36,200; of this amount, $18,800 will be provided through Public Law 566 while other sources will contribute $17,400. Included in the total cost of the forest land treatment program is a one-half ton pick-up truck and equipment valued at $5,200. The PL-566 funds are for three purposes: (1) to accelerate technical assistance for forest management ($5,400), (2) to provide a local fire prevention contactor program to contact landowners and forest users during the fire season ($10,800). and (3) to provide 50 percent of pick-up truck ($2,600). The contactor program will be administered by the State Forestry Commission. The local cost of $17,400 is for their share of the pick-up truck ($2,600), costs for applying the recommended forest land treatment measures ($7,500), costs for fire control ($5,300), and costs involved in technical assistance ($2,000). See table 1.

The Alabama Forestry Commission will provide accelerated technical assistance for fire prevention and forest management. The landowners will provide the tools, equipment, and funds necessary for treatment of their forest lands. The technical assistance cost is based on present costs of the current cooperative forest management program.

CHANNEL WORK

The estimated construction cost of the channel work is $241,400. Engineering services will cost about $19,000 and project administration about $38,000. The construction cost includes three rock riprap drop structures and a 12 percent contingency allowance. Engineering costs include field surveys, detailed designs, and engineering services during construction. Administrative costs include record keeping, contract administration, travel, advisory services, etc. Land rights are valued at $18,700; this includes $15,800 for easements on 145 acres of land and $2,900 for altering existing bridges. Total installation cost of the proposed channel work is $317,100.

The total estimated cost of the project according to the source of funds allocated per construction year is as follows:

	PUBLIC LAW 566 FUNDS		OTHER FUNDS		
YEAR	LAND TREATMENT	CHANNEL WORK	LAND TREATMENT	CHANNEL WORK	TOTAL
1st	$ 11,000	$260,400	$ 32,000	$17,000	$320,400
2nd	11,000	36,000	32,000	3,700	82,700
3rd	11,000	---	32,000	---	43,000
4th	11,000	---	32,000	---	43,000
5th	10,800	---	31,400	---	42,200
TOTAL	$ 54,800	$296,400	$159,400	$20,700	$531,300

BENEFITS - MONETARY

The average annual benefits for reducing agricultural flood damages are about $3,200. Annual flood damage reduction to roads and bridges and to urban areas is estimated to be $2,000 and $1,150 respectively. Flood plain scour will be reduced by an estimated $100 annually. Indirect* damages will be reduced by approximately $1,150 annually. Total estimated average annual benefits from flood damage reduction is $7,600 (see table 5).

As flood damage reduction is realized, some land that was once unproductive will be put to productive agricultural uses. Also, farmers will apply more intensive land use practices. Annual benefits from changes in agricultural land use and from more intensive land use are estimated to be $3,000 and $3,300 respectively. Benefits from changed land use in the urban area are estimated to be $2,100 annually (see table 6).

Vector control benefits are estimated to be $4,500 annually. These benefits will be realized by reducing flooding which creates temporary ponded areas used by mosquitoes as breeding habitat.

Redevelopment benefits for providing employment to the otherwise unemployed or underemployed are expected to average $4,600 annually. The local economy will benefit from the value of local labor, services, and materials used in project installation and maintenance.

The value of local secondary benefits is estimated at $2,100 annually. These benefits result when additional materials and services are supplied; net returns from project installation are then increased. An example would be the increased net income of an agricultural service dealer from sales to the farmers in the project area. Secondary benefits from a national viewpoint were not considered pertinent to the economic evaluation of this project.

Annual benefits** are estimated as follows:

ITEM	AVERAGE VALUE
Flood Damage Reduction	$7,300
More Intensive Land Use	3,300
Changed Land Use (Agricultural)	3,000
Changed Land Use (Urban)	2,100
Redevelopment	4,600
Vector Control	4,500
Secondary	2,100
TOTAL	$26,900

* Damages realized as a result of other floodwater damages, such as costs of detouring traffic when a bridge is washed out.

** See table 6 for detailed information.

COMPARISON OF BENEFITS AND COSTS

The average annual benefits WITHOUT local secondary benefits are estimated to be $24,800. With an estimated average annual cost of $20,200, the benefit-cost ratio WITHOUT local secondary benefits is 1.2:1.0.

Total average annual benefits from structural measures will be about $26,900 while average annual costs will be about $20,200. This gives a benefit-cost ratio of 1.3:1.0 (see table 6).

INSTALLATION PROVISIONS

LAND TREATMENT MEASURES

Landowners will establish the planned treatment measures on their land within the 5-year installation period in cooperation with the Cullman County Soil and Water Conservation District. The District will provide technical assistance for the planning, application, and maintenance of land treatment measures. The Soil Conservation Service, using PL-566 funds, will supplement the technical assistance provided under the ongoing district program. This additional technical assistance will accelerate planning, and will expedite the application of land treatment measures.

The Alabama Forestry Commission, in cooperation with the U. S. Forest Service, will provide technical assistance in the planning and application of forest land treatment measures. They will provide additional technical assistance for fire control through a local fire prevention contactor program. A pick-up truck with fire suppression equipment will be provided as part of the fire control program.

STRUCTURAL MEASURES

The Cullman County Commission and the city of Hanceville will acquire all necessary land rights for installation of structural measures. The city will be responsible for obtaining needed land rights and arranging for the modifications of any utility lines, etc., needed to install the works of improvement within the city limits of Hanceville. The County Commission will have the same responsibilities outside the city limits. Powers granted by the state, including the power of eminent domain, will be used if necessary to obtain the necessary land rights. All necessary land rights will be acquired before PL-566 funds are made available. Land rights will be provided by the sponsors prior to construction to offset any possible induced damages downstream.

The Cullman County Commission will serve as the contracting local organization during project installation. The Soil Conservation Service will prepare plans, specifications, and cost estimates; provide construction inspection; and cooperate in the final inspection.

Clearing of vegetation prior to excavation will be held to a minimum but will be sufficient to allow construction to progress unhampered. Culverts and rock structures will be installed on laterals at their confluence with a main stream prior to proceeding with upstream excavation.

Channel work on Mud Creek main will begin at the lower end near station 258+60 and proceed upstream to station 39+00, see Project Map. Channel side slopes, berms, spoil areas, and other disturbed areas will be vegetated immediately after completion of an excavation reach or as soon thereafter as weather permits.

OPERATION AND MAINTENANCE PROVISIONS

Landowners will maintain the treated land under cooperative agreements with the Cullman County Soil and Water Conservation District. The Soil Conservation Service will provide technical assistance through the District for maintenance of land treatment measures.

The forest land treatment measures will be maintained by the landowners and operators under agreement with the Cullman County Soil and Water Conservation District. The Alabama Forestry Commission, in cooperation with the U. S. Forest Service, will furnish technical assistance necessary for operating and maintaining the forest land treatment measures under the going Cooperative Forest Management Program. The Alabama Forestry Commission will continue to furnish fire protection under the Cooperative Forest Fire Control Program.

Following completion of the structural measures, the Cullman County Commission and the City of Hanceville will be responsible for all maintenance determined to be needed by either the sponsors or the Service. Such maintenance will be performed promptly and without cost to the Service. The Cullman County Commission will perform the maintenance needed in the county and the city of Hanceville will perform any maintenance needed within the city limits. Total average annual operation and maintenance cost is estimated to be $1,500.

After the Service determines that the contractor's initial vegetative work is complete, an establishment period will begin. The establishment period is for the purpose of establishing permanent vegetation and achieving stability. The establishment period terminates when the Service notifies the sponsoring local organization that vegetative cover is established, or after two growing seasons have elapsed since the initial installation of the vegetative measure, whichever occurs first. Repairing of structural failures which occur during the establishment period will be paid for by PL-566 funds. Repair work may include placing additional riprap, restoring damaged areas, and re-establishing vegetation. This period will allow the channel to reach a stable aged condition. During the establishment period the sponsors will be responsible for all normal maintenance.

The County Commission and the City of Hanceville will insure that full vegetative cover is maintained and that channel flow remains unimpeded. Periodic channel cleanout is an essential part of the maintenance program. Besides removing debris from the waterway, the city and county will control vegetation and repair or replace inlets or other structures as required. They will also insure that the aesthetic qualities of the

project are maintained and/or improved. Aesthetic development will be an important consideration in the maintenance program. Maintenance will involve such items as mowing, fertilizing and reseeding, and removing debris. Since the channel is self-operating, no special operations or channel manipulations will be required.

Removing sand bars and filling, shaping, and vegetating eroded banks may be required. It should be noted that when natural sand bars develop, the City and County will insure their removal as part of the routine maintenance program. At no time will the City or County alter the original shape or direction of the channel, modify channel inlets, or grossly change any other areas within or adjacent to the channel without first coordinating with the Service.

An annual operation and maintenance inspection program will be carried out and documented by a responsible official of the county, preferably accompanied by a landowner actively farming in the vicinity. A copy of the findings of this inspection will be sent to the Soil Conservation Service. The inspection will be made during the dry season (late spring and early summer). Needed maintenance will be completed before the start of the next rainy season. All components of the structural works of improvement will be inspected.

The Soil Conservation Service and the Cullman County Soil and Water Conservation District will participate in the inspections in the first three years and thereafter as deemed necessary. Additional inspections will be made soon after major storms or periods of unusually heavy rainfall so as to locate any needed maintenance caused by the event. Years with major storms will require inspections at more frequent intervals than 12 months. The intent is to accomplish needed maintenance prior to the re-curring storm that might seriously aggravate the situation.

An operation and maintenance (O&M) agreement will be entered into by the County and the Service prior to the signing of a project agreement. The O&M agreement will contain, in addition to sponsor responsibilities for structural measures, specific provisions for retention and disposal of property acquired or improved with PL-566 financial assistance. The O&M agreement will also contain a reference to the State Watersheds Operation and Maintenance Handbook. An O&M plan will be prepared for the channel work.

FINANCING PROJECT

Federal assistance for installing the works of improvement on non-federal land, as described in this work plan, will be provided under the authority of the Watershed Protection and Flood Prevention Act (Public Law 566, 83rd Congress; 68 Stat. 666), as amended. This assistance is contingent on the appropriation of funds for this purpose and the sponsoring local organizations' meeting their necessary prior obligations.

Structural measures will be installed pursuant to the following conditions:

1. All land rights have been acquired for structural measures
2. PL-566 funds are available
3. Project agreements have been signed
4. Operation and maintenance agreements have been signed

The land treatment measures will be voluntarily installed by the land-owners and operators at their expense. Cost sharing assistance under programs administered by the Agricultural Stabilization and Conservation Service is available in applying certain conservation land treatment measures. PL-566 funds will finance the accelerated technical assistance provided by the Soil Conservation Service and the Alabama Forestry Commission in cooperation with the U. S. Forest Service in applying the land treatment measures.

PL-566 funds will be used to finance 80 percent of the fire prevention contactor program. The remaining 20 percent will be borne by the State Forestry Commission from appropriated funds. The fire suppression pick-up truck and equipment will be financed 50-50 between PL-566 funds and State Forestry Commission funds.

PL-566 funds will finance 100 percent of the construction and engineering costs of installing the proposed channel. The Cullman County Commission and the City of Hanceville will finance all costs incurred in acquiring the land rights. Funds for procuring easements will be provided from existing local tax sources; however, easements are expected to be donated. The County Commission will provide contracting services and will finance the replacement of a bridge at a dirt road, station 74+80. PL-566 will finance all administrative costs, such as construction inspection, travel, etc., incurred by the Government. The local sponsors will provide for administrative costs which they incur. Structural cost distributions are shown in table 2.

Prior to entering into agreements that obligate funds of the Service, the Cullman County Commission will have a financial management system

for control, accountability, and disclosure of PL-566 funds received, and for control and accountability for property and other assets purchased with PL-566 funds.

Program income earned during the grant period will be reported on the sponsor's request for advance or reinbursement from the Service.

TABLE 1 - ESTIMATED PROJECT INSTALLATION COST
Mud Creek Watershed, Alabama

INSTALLATION COST ITEM	UNIT	NUMBER NON-FED. LAND	ESTIMATED COST (DOLLARS) 1/ PL-566 FUNDS NON-FEDERAL LAND S.C.S.3/	F.S.3/	TOTAL	OTHER NON-FEDERAL LAND S.C.S.3/	F.S.3/	TOTAL	TOTAL
LAND TREATMENT									
Land Areas 2/	Acres								
Cropland	to be	200	-	-	-	18,150	-	18,150	18,150
Pastureland	treated	900	-	-	-	107,750	-	107,750	107,750
Forest land		300	-	-	-	-	7,500	7,500	7,500
Other land		20	-	-	-	1,100	-	1,100	1,100
Individual Practices									
Fire control equipment			-	2,600	2,600	-	2,600	2,600	5,200
Fire control			-	10,800	10,800	-	5,300	5,300	16,100
Technical Assistance			36,000	5,400	41,400	15,000	2,000	17,000	58,400
TOTAL LAND TREATMENT			36,000	18,800	54,800	142,000	17,400	159,400	214,200
STRUCTURAL MEASURES									
Construction									
Channel modification 4/	Miles								
(N)		3.4	216,600	-	216,600	-	-	-	216,600
(M)		.5	11,500	-	11,500	-	-	-	11,500
(O)		.8	13,300	-	13,300	-	-	-	13,300
Subtotal-Construction		4.7	241,400	-	241,400	-	-	-	241,400
Engineering Services			19,000	-	19,000	-	-	-	19,000
Project Administration									
Construction inspection			21,000	-	21,000	1,000	-	1,000	22,000
Other			15,000	-	15,000	1,000	-	1,000	16,000
Subtotal-Administration			36,000	-	36,000	2,000	-	2,000	38,000

TABLE 1 - ESTIMATED PROJECT INSTALLATION COST (Cont'd)
Mud Creek Watershed, Alabama

INSTALLATION COST ITEM	UNIT	NUMBER NON-FED. LAND	ESTIMATED COST (DOLLARS) 1/ PL-566 FUNDS NON-FEDERAL LAND S.C.S.3/	F.S.3/	TOTAL	OTHER NON-FEDERAL LAND S.C.S.3/	F.S.3/	TOTAL	TOTAL
Other Costs 5/									
Land rights			-	-	-	18,700	-	18,700	18,700
Subtotal-Other			-	-	-	18,700	-	18,700	18,700
TOTAL STRUCTURAL MEASURES			296,400	-	296,400	20,700	-	20,700	317,100
TOTAL PROJECT			332,400	18,800	351,200	162,700	17,400	180,100	531,300

1/ Price base 1975.
2/ Includes only areas estimated to be adequately treated during the project installation period. Treatment will be accelerated throughout the watershed, and dollar amounts apply to total land areas, not just to adequately treated areas.
3/ Federal agency responsible for assisting in installation of works of improvement.
4/ Type of channel prior to project: (N)-an unmodified, well-defined natural channel or stream; (M)-man-made ditch or previously modified channel; (O)-none or practically no defined channel.
5/ Includes $2,900 for bridge modification and $15,800 for easements and rights-of-way.

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TABLE 1A - STATUS OF WATERSHED WORKS OF IMPROVEMENT
Mud Creek Watershed, Alabama

LAND TREATMENT MEASURES	UNIT	APPLIED TO DATE	UNIT 1/ COST	TOTAL COST
Conservation cropping system	Ac.	230	$ 30.00	$ 6,900
Contour farming	Ac.	315	1.00	315
Crop residue use	Ac.	394	4.00	1,576
Drainage field ditches	Ft.	5,750	.25	1,437
Drainage mains and laterals	Ft.	0	.60	0
Field border	Ft.	7,700	.04	308
Grassed waterways and outlets	Ac.	5	170.00	850
Land smoothing	Ac.	203	40.00	8,120
Ponds	No.	52	1,000.00	52,000
Pasture and hayland management	Ac.	1,041	20.00	20,820
Pasture and hayland planting	Ac.	788	75.00	59,100
Terracing	Ft.	61,221	.05	3,061
Wildlife upland habitat management	Ac.	6	50.00	300
Forest stand improvement	Ac.	57	15.00	855
Forest stand improvement cutting	Ac.	125	5.00	625
TOTAL				$156,267

1/ Price base 1975.

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TABLE 2 - ESTIMATED STRUCTURAL COST DISTRIBUTION
Mud Creek Watershed, Alabama
(Dollars) 1/

ITEM	INSTALLATION COST P. L. 566 FUNDS			INSTALLATION - OTHER FUNDS		TOTAL INSTALLATION COST
	CONSTRUCTION	ENGINEERING	TOTAL P.L.-566	LAND RIGHTS	TOTAL OTHER	
Channel Work						
Main						
39+00-80+50 (O)	13,300	1,000	14,300	1,200	1,200	15,500
80+50-258+60 (N)	216,600	17,300	233,900	16,500	16,500	250,400
Lateral A						
10+00-38+00 (N)	11,500	700	12,200	1,000	1,000	13,200
Subtotal	241,400	19,000	260,400	18,700	18,700	279,100
Project Administration			36,000		2,000	38,000
GRAND TOTAL	241,400	19,000	296,400	18,700	20,700	317,100

1/ Price base 1975.

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TABLE 3 - STRUCTURE DATA
CHANNELS
Mud Creek Watershed, Alabama

CHANNEL DESIGN	REACH STA. (FT)	REACH STA. (FT)	D. A. SQ.MI.	CAPACITY CFS REQ'D	CAPACITY CFS DESIGN	WATER SURF. ELEV.	HYD. GRAD. (FT/FT)	CHANNEL DIMENSIONS BTM. WIDTH (FT)	CHANNEL DIMENSIONS BTM. GRADE (%)	CHANNEL DIMENSIONS DEPTH OF FLOW (FT)	CHANNEL DIMENSIONS SIDE SLOPES	"n" VALUE AGED	"n" VALUE AS BUILT	VELOCITIES (FT/SEC) AGED	VELOCITIES (FT/SEC) AS BUILT	EXC. CU-YDS	TYPE OF WORK 1/	BEFORE PROJECT TYPE OF CH. 2/	BEFORE PROJECT FLOW COND. 3/
Mud Creek	258+60	250+00	12.65	830	829	520.4	0.0007	36	0.09	6.8	1:1	0.040	0.037	2.94	3.18	4,505	III	N	Pr
	250+00	242+00	12.35	765	764	521.0	0.0007	39	0.32	5.7	1:1	0.037	0.032	2.95	3.41	4,505	II	N	Pr
	242+00	207+50	12.18	950	954	521.8	0.00076	46	0.076	5.2	3:1	0.035	0.025	2.98	4.17	27,740	II	N	Pr
	207+50	186+00	10.24	845	845	524.4	0.00082	38	0.082	5.2	3:1	0.035	0.025	3.03	4.24	18,315	II	N	I
	186+00	175+40	8.64	750	748	526.1	0.0009	31	0.09	5.2	3:1	0.035	0.025	3.09	4.33	10,443	II	N	I
	175+40	147+00	6.50	615	615	527.5	0.00138	34	0.138	4.0	3:1	0.035	0.025	3.34	4.68	16,501	II	N	I
	147+00	132+00	4.84	500	503	532.2	0.0019	29	0.19	3.8	3:1	0.040	0.025	3.29	5.26	2,722	II	N	E
	132+00	104+00	3.20	380	374	535.0	0.0019	20	0.19	3.8	3:1	0.040	0.025	3.14	5.02	5,081	II	N	E
	104+00	80+50	2.87	350	349	540.4	0.0030	14	0.30	3.7	3:1	0.040	0.025	3.75	6.00	6,451	II	N	E
	80+50	67+20	1.91	260	269	547.4	0.0035	12	0.35	3.5	3:1	0.045	0.025	3.41	6.14	2,956	I	O	E
	67+20	39+00	1.57	225	227	551.7	0.0051	10	0.51	3.1	3:1	0.045	0.025	3.79	6.82	5,479	II	N	E
Lateral No. 2	38+00	10+00	1.15	130	141	535.0	0.0020	4	0.20	3.8	3:1	0.045	0.025	2.41	4.34	3,594	II	M (1972)	E

1/ I-Establishment of new channel including necessary stabilization measures; II-Enlargement or realignment of existing channel or stream; III-Cleaning out natural or man-made channel (includes bar removal and major clearing and snagging operation).

2/ N-An unmodified, well-defined natural channel or stream; M( )-Man-made ditch or previously modified channel (show approximate date of original major construction in parenthesis); O-None or practically no defined channel.

3/ Pr-Perennial--flows at all times except during extreme drought; I-Intermittent--continuous flow through some seasons of the year but little or no flow through other seasons; E-Ephemeral--flows only during periods of surface runoff, otherwise dry.

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TABLE 4 - ANNUAL COST
Mud Creek Watershed, Alabama
(Dollars) 1/

EVALUATION UNIT	AMORTIZATION OF INSTALLATION COST 2/	OPERATION AND MAINTENANCE COST	TOTAL
Channel Work	16,500	1,500	18,000
Project Administration	2,200	-	2,200
GRAND TOTAL	18,700	1,500	20,200

1/ Price base 1975
2/ 100 years @ 5 7/8 percent interest.

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TABLE 5 - ESTIMATED AVERAGE ANNUAL FLOOD DAMAGE REDUCTION BENEFITS
Mud Creek Watershed, Alabama
(Dollars) 1/

ITEM	ESTIMATED AVERAGE ANNUAL DAMAGE		DAMAGE REDUCTION BENEFIT
	WITHOUT PROJECT	WITH PROJECT	
Floodwater			
Crop and Pasture	2,250	900	1,350
Other Agricultural	3,350	1,500	1,850
Nonagricultural			
Road and Bridge	3,700	1,700	2,000
Urban	1,900	750	1,150
Subtotal	11,200	4,850	6,350
Erosion			
Flood Plain Scour	175	75	100
Indirect	1,600	450	1,150
TOTAL	12,975	5,375	7,600

1/ Price base: crop and pasture damages current normalized prices (October 1975), other damages 1975 prices.

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TABLE 6 - COMPARISON OF BENEFITS AND COSTS
Mud Creek Watershed, Alabama
(Dollars)

EVALUATION UNIT	AVERAGE ANNUAL BENEFITS 1/							TOTAL	AVERAGE ANNUAL 3/ COST	BENEFIT-COST RATIO
	DAMAGE REDUCTION	MORE INTENSIVE LAND USE	CHANGED LAND USE		REDEVELOP-MENT	VECTOR CONTROL	SECOND-ARY			
			AGR.	URBAN						
Channel Work	7,300	3,300	3,000	2,100	4,600	4,500	2,100	26,900	18,000	1.5:1.0
Project Administration									2,200	
GRAND TOTAL	7,300 2/	3,300	3,000	2,100	4,600	4,500	2,100	26,900	20,200	1.3:1.0

1/ Price base: crop and pasture benefits current normalized prices (October 1975), other benefits 1975 prices.
2/ In addition, it is estimated that land treatment measures will provide flood damage reduction benefits of $300 annually.
3/ Amortized for 100-years at 5 7/8 percent interest.

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ADDENDUM

MUD CREEK WATERSHED

CULLMAN COUNTY, ALABAMA

INTRODUCTION

This addendum is based on the Water Resource Council's "Principles and Standards for Planning Water and Related Land Resources," which became effective October 30, 1973. It is prepared to be consistent with the requirements of the Water Resource Council's Procedure No. 1 for the phase-in of the Principles and Standards. The information presented is:

Part 1 - Benefits to Cost Comparison

An evaluation of the selected plan using current normalized prices, current construction costs, and the current interest rate.

Part 2 - Four Account Displays

Evaluated effects of the selected plan are displayed under separate accounts for (1) National Economic Development, (2) Environmental Quality, (3) Regional Development, and (4) Social Well-Being. The displays are consistent with the intent of the Principles and Standards.

Part 3 - Abbreviated Environmental Quality Plan

An environmental quality plan, consistent with the intent of the Principles and Standards, but which is abridged in detail, has been developed by an interdisciplinary team. It is an alternative plan to the selected plan and is formulated to enhance environmental quality by the management, conservation, preservation, creation, restoration, or improvement of the quality of certain natural and cultural resources and ecological systems. This plan was formulated from information and data obtained during the investigative and analysis phases of project planning. Formulation began with the inventory and recognition of the watershed problems and needs. Desired environmental effects, as translated from the problems and needs, provided a basis for examining appropriate water and land resource use and management opportunities. Opportunities that emphasized contributions to the component needs were selected and are shown as plan elements of the abbreviated environmental quality plan. The cost of $414,200 for its installation is a preliminary estimate.

Implementation of features of this environmental quality plan would require acceptance by the local people. Adequate legal authorities do exist for installation; however, funding for all plan elements is presently not available.

PART 1

The average annual project costs, benefits, and benefit-cost ratio based on a 6 1/8 percent interest rate, current normalized prices and a 1975 price base is as follows:

1.	Project costs	$21,000
2.	Project benefits	$27,200
3.	Benefits without secondary	$25,100
4.	Project benefit-cost ratio	1.3:1.0
5.	Benefit-cost ratio (without secondary)	1.2:1.0

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PART 2

Selected Plan

NATIONAL ECONOMIC DEVELOPMENT ACCOUNT

Components	Measures of Effects 1/ (Dollars)
Beneficial effects:	
A. The value to users of increased outputs of goods and services.	
1. Flood prevention	15,700
2. Vector control	4,500
3. Utilization of unemployed and underemployed labor resources	
Project construction and Operation and Maintenance	4,600
Total beneficial effects:	24,800

Components	Measures of Effects 1/ (Dollars)
Adverse effects:	
A. The value of resources required for a plan.	
1. Excavated earth channel	
a. Project installation (Structural Measures)	16,500
b. Administration	2,200
c. Operation & Maintenance	1,500
Total adverse effects:	20,200
Net beneficial effects:	4,600

1/ Average annual

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Selected Plan

ENVIRONMENTAL QUALITY ACCOUNT

Components	Measures of Effects
A. Areas of natural beauty	1. Funds and resources would be available to enhance the physical appearance of 285 farms or parts of farms, and about 50 acres of urban land within Hanceville.
	2. The removal of excess water will add to the scenic beauty of 600 acres in the flood plain area. Conservation land treatment measures will add to the scenic beauty of the entire watershed.
	3. Visual quality of the area will be reduced by the removal of trees and excavation during the construction process.
B. Quality considerations of water and land resources	1. Reduce erosion rates by 27 percent on cropland and 35 percent on pastureland.
	2. Reduce sediment deposition at the mouth of the watershed by 31 percent.
	3. Eliminate potential mosquito breeding habitat.
	4. Reduce sewage spills caused by flooding of a sewage treatment plant.
	5. Increase suspended sediment concentration in the stream during channel construction
C. Biological resources and selected ecosystems	1. Wildlife food and cover will be provided by vegetation planted on the spoil areas.
	2. Removal of trees and underbrush for project installation.
	3. Modification of 4.7 miles of stream system by channel excavation.
	4. Cause a direct loss of 69 acres of bottom land forest.

ENVIRONMENTAL QUALITY ACCOUNT

D. Irreversible and irretrievable commitments	1. Seventeen acres of agricultural land will be committed to the channel; 3 acres pastureland, 14 acres forest land.
	2. Removal of trees now bordering stream channel.
	3. Labor, materials, and energy for construction of project measures.

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Selected Plan

REGIONAL DEVELOPMENT ACCOUNT

Components	Measures of Effects 1/ State of Alabama (Dollars)	Rest of Nation
A. Income: Beneficial effects:		
1. The value of increased output of goods and services to users residing in the region.		
a. Flood prevention	15,700	
b. Vector control	4,500	
c. Utilization of regional unemployed or underemployed labor resources (Project construction and O&M)	4,600	---
2. The value of output to users residing in the region from external economics. Secondary	2,100	--
Total beneficial effects:	26,900	--

Components	Measures of Effects 1/ State of Alabama (Dollars)	Rest of Nation
A. Income Adverse effects:		
1. The value of resources contributed from within the region to achieve the outputs.		
a. Excavated earth channel Project installation (Structural Measures)	1,100	15,400
Administration	100	2,100
Operation & Maintenance	1,500	---
Total adverse effects:	2,700	17,500
Net beneficial effects:	24,200	-17,500

1/ Average annual

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Selected Plan

REGIONAL DEVELOPMENT ACCOUNT (Cont'd-2)

Components	Measures of Effects 1/ State of Alabama (Dollars)	Measures of Effects 1/ Rest of Nation (Dollars)
B. Employment: Beneficial effects:		
1. Increase in the number and types of jobs		
a. Employment for project construction.	9 semiskilled -- jobs during the 2 yrs. of channel construction.	
b. Employment for operation and maintenance.	1 permanent part-time unskilled job. 1/	

Components	Measures of Effects 1/ State of Alabama (Dollars)	Measures of Effects 1/ Rest of Nation (Dollars)
B. Employment: Adverse effects:		
Net beneficial effects	9 semiskilled -- jobs during the 2 yrs. of channel construction. 1 permanent part-time unskilled job. 1/	

1/ Average annual

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Selected Plan

REGIONAL DEVELOPMENT ACCOUNT (Cont'd-3)

COMPONENTS	Measures of Effects	
	State of Alabama	Rest of Na
C. Population distribution		
Beneficial effects:	Create 9 semiskilled jobs during 2-yr. structural measure installation period and 1 permanent part-time job in an area that has experienced a 72.7 percent increase in population from 1960 to 1970.	---
Adverse effects:	---	---
D. Regional economic base stability		
Beneficial effects:	Reduce floodwater damages and provide for more efficient land use on 600 acres of flood plain land. Create 9 semiskilled short-term jobs and 1 permanent unskilled part-time job in a low income area.	---
Adverse effects:	---	---

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Selected Plan

SOCIAL WELL-BEING ACCOUNT

Components	Measures of Effects
Beneficial and adverse effects:	
A. Real income distribution	1. Create 9 man-years of semiskilled employment during 2 yrs. of channel work and 1 permanent unskilled part-time job.
	2. Create an average annual regional 1/ income benefit distribution of $24,800.
	3. Induce average annual costs of $2,700.
B. Life, health and safety	1. Reduce flood damages by about 60 percent on 550 acres of agricultural land and 50 acres of urban land. Flooding will be reduced at residences and commercial properties within the urban area. Pollution will be reduced, and health and sanitation conditions will be improved by reducing flooding of a sewage treatment plant.

1/ The realization of damage reduction benefits is considered to occur in the watershed area. Average annual secondary benefits of $2,100 will occur outside the area.

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PART 3

ABBREVIATED ENVIRONMENTAL QUALITY PLAN

Mud Creek Watershed, Alabama

The goals of this environmental quality plan for the Mud Creek Watershed are to preserve and enhance areas of natural beauty; to maintain and improve the quality of the water, land, and air resources; and to preserve and enhance the biological resources and ecosystems of the watershed so that man can live in an aesthetically and culturally pleasing environment.

The principal environmental quality problems in the watershed are the deterioration of the land, plant, and water resources associated with intensified agricultural use, and an associated nuisance problem in the urban area caused by frequent flooding.

The watershed covers 11,750 acres in Cullman County, Alabama. Topography ranges from nearly level to steep. The watershed is highly agricultural with about 52 percent of the area used for pasture or crops. Flooding problems have reduced both the quality and quantity of row crops produced so well as certain wildlife food, cover, and nesting areas. Flooding also causes damages to agricultural and urban properties. In addition, flood waters create temporarily ponded areas near Hanceville, which ultimately cause a mosquito problem. Past clearing of pine stands and bottom land hardwoods has reduced wildlife habitat in the area. Sheet erosion contributes to the sediment loads carried by the streams and reduces water quality. Treated sewage dumped into the creek also reduces water quality.

Component needs for solving problems relating to specific environmental conditions are listed below:

1. Areas of Natural Beauty
   a. Reduce sheet and roadbank erosion.
   b. Eliminate sewage in the stream.
   c. Preserve and maintain beaver impoundments.

2. Quality of Water, Land, and Air Resources
   a. Improve streamflow quality by reducing concentrations of suspended sediment.
   b. Improve water quality by eliminating sewage spills.
   c. Protect the land resource base from deterioration by reducing sheet and roadbank erosion and flood plain scour.
   d. Reduce flood damages by land treatment.
   e. Prevent future potential flood damages to urban properties by zoning.

3. Biological Resources and Ecosystems
   a. Preserve and enhance the wetland wildlife habitat created by temporary beaver impoundments.
   b. Create and maintain upland game habitat and allow streambank cover to revert back to mixed hardwoods.

The plan elements for environmental quality consist of management practices and conservation land treatment measures. Land treatment measures would be planned to reduce erosion and agricultural flood damage, to provide wildlife food and cover, and to beautify the area. Channel work would be limited to removing obstructions to restore original capacity.

A wet area caused by trapped floodwaters would be managed for wetland wildlife habitat. This area would be managed by the County or State to provide wildlife food and shelter.

Land users would be encouraged to apply and maintain conservation land treatment measures by the local soil and water conservation district. Financial assistance is available through programs administered by the Agricultural Stabilization and Conservation Service. Sloping and vegetating, and other improvements necessary to prevent roadbank erosion, would be installed by the County.

The sewage treatment plant would be diked or moved from the flood plain area to eliminate sewage spills caused by flooding. The urban area would also be zoned to eliminate potential flood damages.

The estimated installation costs of the elements of the environmental quality plan are as follows:

1.	Applying conservation land treatment measures	$214,200
2.	Stabilizing roadbanks	$100,000
3.	Removing channel obstructions	$ 40,000
4.	Managing beaver impoundments	$ 10,000
5.	Diking sewage treatment plant	$ 50,000
6.	Zoning urban flood plain	No Installation Cost

The total installation cost of implementing the environmental quality plan is estimated to be $414,200.

The environmental effects that would result from implementing the environmental plan are as follows:

1. Areas of Natural Beauty
   a. Enhance the physical appearance of 285 farms or parts of farms.
   b. Improve the scenic quality of eroded cropland and roadbanks.

c. Improve the scenic value of the stream by eliminating sewage spills.
d. Improve scenic value of beaver impoundments with wildlife plantings.

2. Quality of Water, Land, and Air Resources
   a. Reduce the sediment load carried by the stream.
   b. Improve water quality by eliminating sewage spills caused by flooding.
   c. Reduce deterioration of the land by providing protection from erosion through conservation land treatment measures.
   d. Reduce flooding and flood plain scour on the 600 acre flood plain.

3. Biological Resources and Selected Ecological Systems
   a. Create and maintain upland wildlife food and cover through conservation land treatment.
   b. Preserve and manage beaver impoundments for wildlife habitat.

4. Irreversible and Irretrievable Commitments
   a. One acre for diking a sewage treatment plant.
   b. Labor, materials, and energy for installation of the project measures.

PART II

FINAL ENVIRONMENTAL IMPACT STATEMENT

USDA-SCS-EIS-WS-(ADM)-75-3-(F)-AL

MUD CREEK WATERSHED
CULLMAN COUNTY, ALABAMA

FINAL ENVIRONMENTAL IMPACT STATEMENT

William B. Lingle
State Conservationist
Soil Conservation Service

Sponsoring Local Organizations

Cullman County Soil and Water Conservation District
Hobart Warren, Chairman
P. O. Box 456
Cullman, Alabama 35055

Cullman County Commission
Herman S. Plunkett, Chairman
Cullman, Alabama 35055

City of Hanceville
Wilson Ballard, Mayor
Hanceville, Alabama 35077

March 1976

Prepared By

U. S. DEPARTMENT OF AGRICULTURE
Soil Conservation Service
P. O. Box 311
Auburn, Alabama 36830

USDA ENVIRONMENTAL IMPACT STATEMENT

MUD CREEK WATERSHED
Cullman County, Alabama
Prepared in Accordance with
Sec. 102(2) (C) of P.L. 91-190

SUMMARY

I. Final

II. Soil Conservation Service

III. Administrative

IV. Project Description: This project is for watershed protection and flood prevention in Cullman County, Alabama to be implemented under authority of the Watershed Protection and Flood Prevention Act (P.L. 566, 83rd Congress, 68 stat. 666) as amended. The plan proposes that conservation land treatment measures be applied on 2,350 acres of cropland, 3,720 acres of pastureland, and 4,940 acres of forest land; and 4.7 miles of channel work. Channel work will consist of earth excavation to enlarge present channels and provide a more efficient and unrestricted streamflow. Streamflow within the 4.7 miles of channel work consists of 2.6 miles of ephemeral, 1.1 miles of intermittent, and 1.0 mile of perennial. Three rock drop structures will also be installed to avoid excessive velocities. These measures are to be accomplished during a 5-year period.

V. Summary of Environmental Impacts: Action on the project will:

1. Reduce erosion and sedimentation by 31 percent
2. Reduce fertilizer losses and improve farming efficiency
3. Improve aesthetics on uplands
4. Reduce forest fires
5. Reduce agricultural and urban floodwater damages
6. Reduce road and bridge damages
7. Increase real estate tax base
8. Improve the local agricultural economy
9. Provide for urban expansion
10. Reduce mosquito problems
11. Create employment
12. Temporarily reduce about one mile of stream fishery
13. Increase sedimentation and stream turbidity during construction
14. Cause a direct loss of 69 acres of bottom land forest
15. Temporarily increase noise and air pollution
16. Slightly increase the depth of flooding immediately below the channel work

VI Alternatives Considered:

1. Accelerated conservation land treatment
2. Accelerated conservation land treatment and flood plain zoning
3. Accelerated conservation land treatment and two floodwater retarding structures
4. Accelerated conservation land treatment, an urban channel for the 10-year storm, and on agricultural channel for the 0.75-year storm
5. No project

VII. Agencies, Groups, and Individuals From Which Written Comments on the Draft Environmental Impact Statement Were Received:

1. Department of the Army
   Corps of Engineers
2. Department of Commerce
3. Department of Housing and Urban Development
4. Department of the Interior
5. Department of Transportation
   U. S. Coast Guard
6. Environmental Protection Agency
7. Alabama State Soil and Water Conservation Committee
   (also Governor's representative)
8. Alabama State Health Department
9. Alabama State Highway Department
10. Bob Truett, Birmingham, Alabama

VIII. Draft Statement Transmitted to CEQ on December 5, 1975.

USDA SOIL CONSERVATION SERVICE FINAL ENVIRONMENTAL IMPACT STATEMENT

for

MUD CREEK WATERSHED (ALABAMA)

Installation of this project constitutes an administrative action. Federal assistance will be provided under authority of Public Law 83-566, 83rd Congress, 68 stat. 666, as amended.

SPONSORING LOCAL ORGANIZATIONS

Cullman County Soil and Water Conservation District
Cullman County Commission
City of Hanceville

PROJECT PURPOSES AND GOALS*

WATERSHED PROTECTION (CONSERVATION LAND TREATMENT)

The purposes and goals for land treatment are to apply conservation practices in such a manner that the land will be used more efficiently while protecting it for future generations. The goals include the use of conservation practices so that treated land results in (1) improvement of the land resource base, (2) improvement of the economic structure of the community, and (3) maintenance of a high quality natural environment.

The purposes and goals also include the use of conservation land treatment practices that will reduce erosion rates and protect the soil resource. Since no sediment detention structures are proposed, land treatment is the only means for reducing sediment entering the channel. Goals for conservation land treatment are not anticipated to be completely achieved due to limited financial resources of the landowners, limited farm size, and natural resistance to change.

FLOOD PREVENTION

The primary purpose of the project is to reduce flooding and floodwater damages through conservation land treatment and channel work. Sponsors desire to reduce flooding of the agricultural flood plain, to increase quality and quantity of agricultural crops produced, and to stimulate more efficient land use. Within the urban area of Hanceville, the city desires to reduce flood damages and provide storm sewer outlets.

Floodwater damages are caused by the inadequate capacity of existing channels and the nearly level terrain.

Improved farming efficiency is also an objective of the project. Farming operations can be performed in a more timely manner and harvesting completed without unnecessary delays when flooding is reduced. This will help increase incomes in this low-income area throughout the life of the project, or as long as the operation and maintenance plan is followed.

* All information and data, except as otherwise noted, were collected during watershed planning investigations by the SCS and the U. S. Forest Service, USDA. References cited are listed in appendix G.

FISH AND WILDLIFE

The sponsors have expressed interest in the improvement of fish and wildlife habitat on individual farm units. The area is best suited for small game management, specifically for such species as bobwhite quail, mourning dove, eastern cottontail rabbit, and gray squirrel. A goal of improving fish pond management has also been set forth by the sponsors.

VECTOR

A goal of channel work is to eliminate a mosquito breeding area near Hanceville. This area becomes inundated during floods creating an ideal habitat for mosquitoes to breed and hatch. The local people desire to reduce mosquito infestation by eliminating this breeding area.

PLANNED PROJECT

LAND TREATMENT MEASURES

Conservation land treatment refers to the application of cultural, structural, and management practices in such a manner that the land is used within the limits of its capabilities and soil losses from erosion are held to acceptable levels. Land treatment is accomplished primarily through the development and implementation of conservation plans and forest management plans.

Technical assistance will be made available to landowners and land users by the Soil Conservation Service (SCS) through the Cullman County Soil and Water Conservation District (S&WCD), and by the Forest Service (FS) in cooperation with the Alabama Forestry Commission (AFC). Technical assistance will be provided for planning, implementing plans, and maintaining conservation measures. 1/

Soil surveys are the basic inventories used in developing land use and treatment alternatives. 2/ A soil survey has been completed and published for Cullman County. 3/

Conservation plans on individual units of land are documents that guide deliberate actions to accomplish land treatment. 4/ Conservation planning involves the use of inventory data for study, evaluation, and selection of future courses of action. Each conservation plan is tailored to fit the needs of a particular unit of land.

The conservation plan outlines appropriate uses for each acre of land and the conservation practices needed for sustained production and protection. 6/ The landowners or land users are the decision makers and arrange to install the plans and determine the rate and sequence in which practices will be applied.

Forest management plans are documents that describe conditions and treatment needs for individual units of forest land. The plans are developed by a professional forester and the landowner or land user in cooperation with the SCS conservationist. Based on the recommendations of the forester, the decisions of the landowner include treatment measures that are needed for sustained forest production and watershed protection. The plans include treatment measures for wildlife habitat, recreation, and environmental enhancement when such uses are desired by the landowner or land user. The forest management plan is incorporated into the conservation plan and results in a single resource plan for the entire unit of land.

Landowners or land users are responsible for installation and maintenance of conservation measures. Conservation land treatment is entirely voluntary on the part of the landowner or land user.

It is recognized that all needed land treatment cannot be accomplished during the 5-year installation period. Many land users will not have adequate financial or land resources to make all needed land use changes or treatment applications. It is, therefore, proper to set land treatment planning and application goals that are compatible with the rate that decision makers are ready, willing, and able to accept.

The conservation planning goals were established after carefully reviewing (1) the Cullman County S&WCD long-range program, (2) the conservation needs within the watershed, (3) the current rate of land treatment, and (4) the ability and willingness of landowners and land users to apply conservation measures. Conservation plans, totaling 4,060 acres, have already been developed on 56 of the 285 farms in the watershed.

Conservation plans will develop at almost four and one-half times the present rate as a result of the watershed project. It is expected that during the 5-year installation period 60 new conservation plans, representing about 3,000 acres, will be prepared and that 21 of the existing plans will be revised.

As a result of the conservation land treatment program, adequate treatment will be completed on an estimated 200 acres cropland, 900 acres pasture and hayland, 300 acres forest land, and 20 acres wildlife land by the end of the installation period. This is in addition to that presently applied. Also, land treatment practices will be installed on the remaining portion of the watershed although complete treatment will not be achieved during the 5-year installation period.

Adequately treated land is land used within its capabilities, where the conservation practices that are essential to its protection and "planned" improvements have been applied. Providing necessary flood protection and maintaining proper ground cover are the major problems in adequately treating land in the watershed. These measures are necessary for healthy plant growth and to minimize erosion.

Forest management plans will be developed on approximately 2,000 acres. It is expected that about 1,300 acres of forest management plans will be included in 60 new conservation plans and about 700 acres will be developed on lands where conservation plans will be revised.

Conservation practices on sloping cropland will reduce soil erosion and water losses from surface runoff. Conservation measures planned for the

nearly level cropland on the flood plain will be designed to reduce water damages to crops, improve the soil, and facilitate farming operations. Conservation practices on pasture and hayland will result in quick protective cover during establishment periods and improve the quality and quantity of forage.

A study of past watershed experience and present trends indicates about 15 major practices need to be installed either separately or in conjunction with other measures to meet desired objectives. The major soil and water conservation measures to be installed and their functions are as follows:

LAND TREATMENT MEASURES	FUNCTION
Conservation Cropping System	Growing crops in a sequence that will provide adequate cover to protect the soil from rainfall. Cropping system sequences vary according to needs of each field for protective soil cover. Cover and green manure are included as needed for soil protection and improvement.
Contour Farming	Cultivating sloping land so that plowing, preparing, planting, and cultivating is done on the contour, to reduce erosion and aid in water control.
Crop Residue Management	Leaving crop residues on the soil surface of cultivated fields to provide soil cover during periods when erosion is critical. Crop residues are used as a mulch to intercept the impact of falling raindrops, therefore keeping soil detachment at a minimum. The tilth of the soil is increased and the water intake of the soil is increased.
Drainage Mains and Laterals	Constructing open drainage ditches to designed size and grade to remove excess surface and subsurface water to improve the plant growing environment.

Pasture and Hayland Management	Using fertilization, weed control, and grazing practices to maintain a good, thick cover or grasses on the soil surface and produce high forage and livestock yields.
Pasture and Hayland Planting	Planting grasses and legumes to establish pasture or hayland to control erosion. After grasses are established, pasture and hayland management practices are used to maintain good grass cover.
Forest Stand Improvement Treatment	Proper using and protecting of forest land to provide increased realization of wildlife, recreation, timber, and watershed benefits through multiple use.
Forest Stand Improvement Cutting	Harvesting and treating of forest stands to minimize disturbance, encourage growth of a new stand, and improve species composition.
Wildlife Wetland Habitat Management	Managing wildlife wetland habitat to provide food and cover for wildlife and to maintain soil cover.
Wildlife Upland Habitat Management	Managing wildlife upland habitat to provide food and cover for wildlife and at the same time provide soil cover.
Field Border	A border or strip of perennial vegetation established at the edge of a field by planting or by converting it from trees to herbaceous vegetation or shrubs.
Grassed Waterway or Outlet	A natural or constructed waterway or outlet shaped or graded and establishe in vegetation suitable to safely dispose runoff from a field, diversion, terrace, or other structure.

Land Smoothing	Removing irregularities on the land surface by use of special equipment. It includes operations ordinarily classed as rough grading. Ordinarily, this does not require a complete grid survey.
Pond	A water impoundment made by constructing a dam or embankment, or by excavating a pit or "dugout".
Fishpond Management	Developing or improving impounded water to produce fish for domestic use or recreation.
Terrace	An earth embankment or a ridge and channel constructed across the slope at a suitable spacing and with an acceptable grade.

Landowners and land users will make use of other ongoing programs administered by the Agricultural Stabilization and Conservation Service and State Forestry Commission, to help finance the installation of certain conservation measures.

In addition to providing technical assistance to help plan and install conservation practices, the watershed program will provide technical assistance during the installation period to advise landowners and land users on methods of controlling forest fires. Funds will also be provided to purchase a pickup truck with a slip-on tanker unit to accelerate the present ongoing forest fire control program.

STRUCTURAL MEASURES

The planned structural measures consist of 4.7 miles of channel work including associated vegetation, rock drop structures, and rock riprap, (see appendix B for location of the proposed measures). Channels are designed to contain the runoff from a 0.5-year, 24-hour rainfall (U. S. Weather Bureau Technical Paper 40). More details of the proposed channel work are discussed later in this section.

Procedures outlined in SCS Technical Release - 25 were used to plan and design all channel work. The channels were analyzed at bank full flow under conditions expected immediately following excavation and after vegetation is established and the channel is in an aged condition. The analysis indicated a stable condition in all reaches of the proposed channel work in the aged condition. Rock drop structures will be installed immediately following channel excavation to stabilize the channel until vegetation can be established. Side slopes will be seeded within one week after being excavated or as soon as conditions permit. The spoil will be seeded as soon as it is dry enough to spread. Permanent vegetation will be established along the entire channel, including areas initially seeded with temporary vegetation. When final construction plans are developed, they will include a detailed vegetative and landscaping plan. The vegetative program will consist of temporary vegetation of channel slopes, berms, and spoil areas. After construction is complete all disturbed areas will be established to permanent vegetation.

The proposed channel will be constructed through soils of the Chewacla, Roanoke, and Taft series. These are all fine-grained soils, and classify as clays and silts (CL and ML respectively) of low to medium plasticity. Channels will be excavated with draglines, scrapers, or other conventional earth-moving equipment. Spoil will be spread and shaped to permit safe mowing and maintenance. Surface water behind spoil banks will flow to the main through spoil openings, rock inlets, and pipes. Pipe will be used where scour is a problem and where needed for maintenance access roads.

For ease of maintenance all channel side slopes, unless otherwise stated, will be three horizontal to one vertical. These side slopes will enable maintenance to be performed with ordinary farm-type equipment.

All existing channels are natural streambeds with the exception of Lateral No. 2; this lateral has been previously modified (see appendix B).

Present conditions and proposed changes by reach length and location, starting at the lower end of the stream, are as follows:

From station 258+60 to station 242+00 channel flow is perennial through a narrow flood plain. There are rock outcrops in the channel bottom and banks. Channel work in this reach is necessary to provide an outlet for upstream channel work. In order to minimize the cost of rock excavation, the channel will be excavated from one side only and the side slopes will be one horizontal to one vertical. The channel in this reach will require major realignment and enlargement below the Louisville and Nashville (L & N) Railroad. The amount of channel work will progressively decrease from station 242+00 to station 258+60; the latter station will have no channel work. This reach of channel will not degrade, and the only maintenance that should be required is removing sand bars that may occur.

From station 242+00 to station 207+50 channel flow is perennial through a narrow flood plain. The existing channel has changed alignment several times in the last 50 years and will be realigned and enlarged above the L&N Railroad. A sewage treatment plant is located near the middle of this reach. There are no rock outcrops in this reach and the major soil encountered is clay.

From station 207+50 to station 147+00 channel flow becomes intermittent and the flood plain widens. Beavers normally build dams across the laterals of Mud Creek restricting streamflow. They attempt to dam the main stream but fail due to flood flows removing the structures. Landowners regularly attempt to destroy these impoundments. The bridge on Highway 31 is large enough to carry storm flows and creates no problems. In this reach, the major soil through which the channel will be constructed is a non-plastic silt.

From station 147+00 to station 104+00 the channel flow changes to ephemeral. The channel meanders through a wide flood plain. The major soil encountered in this reach is clay. The channel will be enlarged and realigned.

From station 104+00 to station 39+00 channel flow is ephemeral through a narrowing flood plain. The major soil type along the path of the proposed channel is clay with some sandy silts. The channel will be enlarged with partial realignment. Because of soil conditions, this reach of channel may have a stability problem immediately after construction. Special efforts will be made to quickly establish vegetation and correct any problem to assure the channel will reach a stable condition. A curved section of the channel may also have bank stability problems. Riprap will be placed on problem areas where necessary to maintain bank stability. The channel work tapers to its termination at station 39+00.

On Lateral No. 2 from station 38+00 to station 10+00 the flow is ephemeral. The lateral has been previously modified by man. The last modification was in 1972. The major soil along the proposed channel is clay. This channel will be realigned and enlarged.

Approximately 4.7 miles of channel work will be installed--4.2 miles on the main and 0.5 mile on Lateral No. 2. This channel work will require about 38 acres of adjacent land for access and maintenance. Also, one bridge at station 74+80 will be replaced. At least 145 acres of land

rights will be required. Present and future with project land use within the land rights area is as follows:

PRESENT		FUTURE WITH PROJECT	
USE	ACRES	USE	ACRES
Channel	14	Channel	31
Forest	107	Forest	38
Pasture	20	Pasture	76
Crops	0	Crops	0
Idle	4	Idle	0

The flood plain widlife habitat is of low value for most species of game with the possible exception of rabbits. The anticipated reduction of 69 acres of forest land along the stream due to channel enlargement should not significantly affect any species of forest wildlife.

There is a wetlands area adjacent to the main channel. This area consists of about 20 acres classified as Type 2 wetlands as defined in U. S. Department of Interior, Circular 39. The wetlands area results from a series of small beaver dams periodically flooding idle pastureland. Some landowners have attempted to control beaver impoundments and reduce wet areas without project installation.

As soon as conditions permit following completion of an excavation reach, the channel side slopes, berms, spoil areas, and other disturbed areas will be vegetated to prevent movement of the soil material. This vegetative program will be a part of the construction contract. Vegetation expected to be used is as follows:

VEGETATIVE COVER FOR STRUCTURAL MEASURES

LOCATION	PLANTING TIME	TYPE COVER
Excavated channel side slopes, berms, and spoil.	Early spring to late summer.	Common bermuda grass, Sericea lespedeza.
Disturbed channel side slopes, berms, and spoil.	Fall.	Tall fescue and white clover.

In order to minimize water and air pollution and to control erosion during construction, contractors will be required to adhere to strict guidelines set forth in the construction contract. Excavation and construction operations will be scheduled and controlled to reduce exposure of unprotected soils to erosion. Clearing prior to excavation will be held to a minimum to reduce erosion but not to the extent to hamper construction progress. Culverts and rock structures will be installed on laterals or side inlets at their confluence with the main stream before proceeding with upstream excavation. Dust and other air pollutants will be held to a minimum. Roads and excavation areas will be sprinkled with water to keep dust within tolerable limits. Construction equipment will be equipped with mufflers to reduce noise. Fuels, lubricants, and chemicals will be adequately labeled and will be safely stored in designated areas; the contractor may dispose of these items only in accordance with approved methods and procedures. Clearing and burning of brush and vegetation will be carried out in accordance with "Proclamation 3" and "Air Polution Control Rules and Regulations" of the Alabama Air Pollution Control Commission.

Appropriate sanitary facilities, including garbage disposal facilities, will be located in conformance with federal, state, and local water pollution control regulations to prevent contamination of live streams, wells, or springs. A construction inspector will monitor sanitary facilities to insure that all environmental control requirements are satisfied. The inspector will be on site throughout the construction period.

According to the Department of Anthropology, University of Alabama, no archaeological sites of value exist within the proposed construction area (see appendix F). If sites are uncovered during construction, the Department of the Interior; Chairman, Department of Anthropology, University of Alabama; and Alabama Historical Commission will be notified. If any archaeological sites of value are identified, provisions of Public Law 86-523 will be followed. The project, as planned, will not affect any cultural resources listed in the National Register of Historic Places, nor will it affect any cultural resources eligible for nomination to the National Register of Historic Places.

OPERATION AND MAINTENANCE

Land treatment measures will be maintained by landowners under the cooperative agreements with the Cullman County Soil and Water Conservation

District. The Soil Conservation Service will provide technical assistance through the District for operation and maintenance of land treatment measures.

The forest land treatment measures will be maintained by the landowners and operators under agreement with the Cullman County Soil and Water Conservation District. The Alabama Forestry Commission, in cooperation with the U. S. Forest Service, will furnish technical assistance necessary for operating and maintaining the forest land treatment measures under the going Cooperative Forest Management Program. The Alabama Forestry Commission will continue to furnish fire protection under the Cooperative Forest Fire Control Program.

The Cullman County Commission and the city of Hanceville will be responsible for and promptly perform, or have performed, without cost to the Service, all maintenance of the structural measures as determined to be needed by either the sponsors or the Service immediately following completion of the structures by the contractor. The County Commission will be responsible for maintenance of vegetation associated with the channel work after the initial vegetation work is adequately completed, as determined by the Service. The funds for O&M will be provided from the county's general tax revenue. The estimated average annual cost of operation and maintenance is $1,500.

Immediately following the construction of the channel an establishment period will begin. During this period intensive programs for establishing vegetative cover will be implemented. The cost of any additional structural measures needed to assure stability and repair of minor damages will be paid for with PL-566 funds. Items of normal maintenance such as mowing, removal of debris, etc., will be performed by the sponsors at no cost to the Service.

The sponsors are responsible for seeing that operation and maintenance is performed in a timely, adequate, and otherwise appropriate manner to assure efficient operation and functioning of the channel for the life of the project.

Channel maintenance includes such activities as periodic cleanouts necessary to restore channels to their planned capacities, controlling beavers (this includes removing beaver dams to restore channels to their planned capacities), repairing of eroded areas or washouts on channel banks, control of vegetation that will reduce channel capacities, and repair or replacement of side inlets and other structures. Maintenance and improvement of the general attractiveness and beauty of the channel shall be considered as important features of the maintenance program.

An annual inspection will be performed and documented by a responsible official of the County, preferably accompanied by a landowner actively farming within the project area. The inspection should be made in late spring or early summer so that needed maintenance can be completed before the start of the rainy season. Inspections will be made soon after each major storm. More frequent inspections may be required when unusually severe storms occur early in the rainy season. These inspections may help identify problems early and prevent other storms from compounding the problem.

The Soil Conservation Service and the Cullman County Commission will participate in the inspections in the first three years and thereafter as deemed necessary. These inspections, regardless of participants, should be made soon after major storms or periods of unusually heavy rainfall so as to locate any needed maintenance caused by the event.

Years with major storms early in the season may require inspections at more frequent intervals than 12 months. The intent is to accomplish needed maintenance prior to a recurring storm that might seriously aggravate the situation.

An operation and maintenance (O&M) agreement will be entered into by the sponsors and the Service prior to the signing of a project agreement. The O&M agreement will contain, in addition to specific sponsor responsibilities for structural measures, specific provisions for retention and disposal of real and personal property acquired in whole or in part with PL-566 funds. The O&M agreement will also contain a reference to the State Watersheds Operation and Maintenance Handbook.

PROJECT COSTS

The total cost for installing the project is estimated to be $531,300. This cost is shared by Public Law 566 and "Other" funds as follows:

	PL-566	Other	Total
Conservation Land Treatment	$ 54,800	$159,400	$214,200*
Channel Work	296,400	20,700	317,100
TOTAL	$351,200	$180,100	$531,300

Construction cost of the channel is shared by Public Law 566 and "Other" funds as follows:

	PL-566	Other	Total
Construction Cost (Channel Work)	$241,400	0	$241,400

* Includes technical assistance and $5,200 for fire control equipment.

ENVIRONMENTAL SETTING

PHYSICAL RESOURCES

Mud Creek Watershed is located in Cullman County in north-central Alabama. It has an 11,750-acre drainage area, and its population is about 2,500. The only community within the watershed is Hanceville with a population of 2,100. Cullman, Alabama (population 12,600) is located 8 miles northwest of the watershed.

Mud Creek Watershed is located within the south Atlantic Gulf Water Resource Area and the Tombigbee Water Resource Subarea. 8/ Most residents operate small family-type farm units and have low incomes.

The area ranges from gently rolling in the western two-thirds to relatively steep in the eastern one-third. Soil and water resource problems exist throughout the watershed. Flooding occurs frequently because of insufficient outlets and low stream capacities. Portions of Hanceville suffer from frequent floodwater damages. About 600 acres of flood plain area are routinely damaged by floods every year.

In the watershed uplands, especially on the steeper crop fields, sheet erosion reduces soil productiveness. Average annual erosion rates on these croplands exceed the maximum soil-loss tolerance established by the SCS.

Soils and Land Capabilities (see appendix D and D-1)

Soils are described by soil associations which are broad areas of similar landscapes characterized by one or more soil series names. The Albertville-Enders association is comprised of deep, well drained soils on uplands. Typically, they have silt loam surface layers and silty clay or clay subsoils that are underlain by shale bedrock at depths of 3 to 5 feet. Permeability is moderately slow to very slow and runoff is moderate to rapid. Slopes are mostly 2 to 10 percent but range up to about 20 percent. Most of the soils in this association are in land capability classes and subclass IIe, IIIe, and IVe.

The Montevallo soils association is comprised of shallow, well-drained soils on uplands. Typically, they have shaly silt loam surface layers and shaly silt loam or shaly loam subsoils. Shale bedrock occurs at about 10 to 20 inches. Permeability is moderate and runoff is moderate to rapid. Slopes range from 15 to 45 percent. The dominant land capability class and subclass is VIIe.

The Hartselle-Linker association is characterized by moderately deep, well-drained soils on uplands. Typically, they have fine sandy loam surface layers and loam, sandy clay loam or clay loam subsoils. Sandstone bedrock occurs between 30 to 60 inches. Permeability is moderate and runoff moderate to rapid. Slopes are mostly 2 to 10 percent but range to 15 percent. Most of the soils in this association are in land capability classes and subclass IIe, IIIe, and IVe.

Soils of the Taft-Roanoke-Chewacla* association are mostly deep and somewhat poorly drained. They are found on flood plains and in natural depressions. Taft and Roanoke soils normally have silt loam surface layers and silty clay loam or silty clay subsoils. Typically, Chewacla soils have fine sandy loam surface layers and substrata of silt loam, loam or sandy loam.

Taft and Roanoke soils have moderate to slow permeability and moderate to slow runoff. Slopes range from 0 to 2 percent. Land capability classes and subclass are IIIw and IVw. Chewacla soils have moderate permeability and medium to slow runoff. Slopes are 0 to 2 percent. The land capability class and subclass is IIw.

Geology and Topography 10/

The entire watershed is underlain by sandstones and shales of the Pottsville Formation of Pennsylvanian age. The Pottsville consists of a succession of sandstone and shale beds attaining a thickness of almost 1,000 feet. Strike of the Formation is generally east-west with a gentle dip to the south.

The watershed is physiographically located in the Cumberland section of the Appalachian Plateaus. Topography varies from almost level to steep. A narrow flood plain with steep valley walls exists in the eastern one-third of the watershed. In the central and western parts the flood plains along Mud Creek and its tributaries widen with gently rolling valley walls. Elevations in the watershed range from about 450 feet mean sea level in the lower portion to about 950 feet mean sea level in the upper portions giving a total relief of about 500 feet.

* These soil series names differ from those of the Cullman County Soil Survey published in June 1962 because of a change in National Soil Classification System in 1965. Taft, Roanoke, and Chewacla soils were mapped Typer, Purdy, and Phio respectively.

Climate 11/

The watershed has a temperate to mild humid climate. Winters are cold but not severe while summers are rather long and generally hot. The average frost-free period is about 200 days and extends from early April to late October. Mean annual temperature is 61 degrees Fahrenheit (F). January is the coldest month with 43 degrees F average and July the hottest with 78 degrees F average.

The average annual precipitation at the nearby U. S. Weather Bureau Station at Saint Bernard College is 54.08 inches. September and October are usually the driest months while February and March are the wettest.

Mineral and Ground Water Resources

The Pottsville Formation is important as a mineral resource because of its coal-bearing properties. Coal beds are distributed throughout the total thickness of the Formation. Not all the beds are of minable thickness or quality and no workable seams are found in the watershed. 12/ The areas coal reserves are limited to the higher elevations and no significant minerals are known to occur in the immediate watershed area.

Because of the lithologic character of the Pottsville Formation, which is a succession of alternating sandstone and shale layers, drilled wells are the most successful in furnishing water supplies. All the recoverable water is contained in the sandstone beds, the shale being unproductive. Drilled wells for domestic use range in depth from 20 to 150 feet and yield from 10 to 20 gallons per minute.

Deeper wells, some to a depth of about 600 feet, are used for public supplies and yield as much as 175 gallons per minute. All these wells penetrate several sandstone beds, each of which contributes to the total yield. 10/

Land Use

Estimated watershed land use is as follows:*

	WATERSHED	
	Acres	Percent
Cropland	2,350	20
Pastureland	3,720	32
Forest land	4,940	42
Urban and other land	740	6
TOTAL	11,750	100

* For land use distribution, see appendix E.

The Type 1 wetlands occur adjacent to the main stream on lands seasonally flooded. The land use varies from season to season but consists primarily of pasture, idle land, and forest land. Type 5 wetlands in the watershed are limited to farm ponds ranging in size from 0.5 acres to 5 acres. Type 2 wetlands are located near Highway 31 in idle pastureland periodically flooded by beaver impoundments.

PRESENT AND PROJECTED POPULATION

The population of Cullman County in 1970 was 52,445; 24 percent was urban and 76 percent rural. Projected populations for Cullman County 13/ are as follows:

Year -	1980	2000	2020
Population -	61,400	83,100	113,200

Projected populations of the Tombigbee Water Resource Subarea, 8/ which includes Mud Creek watershed are as follows:

Year -	1980	2000	2020
Population -	1,971,600	2,408,500	2,983,200

The population of Hanceville was 1,174 in 1960, and 2,027 in 1970. This indicates an increase in population from 1960 to 1970 of 73 percent. 13/ This population growth is unusually fast for small towns in Alabama and far exceeds the 15 percent increase in Cullman County for the same period. 14/

ECONOMIC RESOURCES

The Cullman County Board of Education owns 20 acres in school grounds and the city of Hanceville owns 10 acres. All other land is in private ownership except for about a 2-acre substation owned by the Tennessee Valley Authority.

Approximately 285 farms or parts of farms exist within the watershed and the average size is about 39 acres. The family farm is the primary source of rural income. Beef cattle production is the major farm enterprise, with corn being the principle row crop produced. Broiler production is also popular in the area.

The present average annual corn yield in the watershed is about 50 bushels per acre. Pasture yields average from 5 to 6 AUM* per acre.

* Animal Unit Month - the amount of grazing required for one mature cow and calf for one month.

Sawtimber volumes average 4,085 board feet per acre of pine. Hardwood volumes are not significant. Pulpwood volumes per acre average 1,130 cubic feet of pine and 64 cubic feet of hardwood.

The value of land in the flood plain ranges from $300 to $500 per acre. Upland property values range from $300 to $600 per acre. Urban land within the flood plain area currently is valued at $400 to $500 per acre. Urban land outside the flood hazard area has a value of $1,500 or more per acre.

The watershed is served by numerous farm-to-market roads, and U. S. Highway 31 and Alabama Highway 91 pass through the area. Interstate Highway 65 is only 10 miles west of the watershed. Rail service is also provided to the area by the Louisville and Nashville Railroad which passes through the eastern portion of the watershed(see appendix B).

The leading sources of employment in and around the watershed are manufacturing, services, and agriculture. About 11.0 percent of the total work force of 23,340 in Cullman County is currently unemployed. 15/ About 51 percent of the total farms in Cullman County have sales of less than $2,500 per year. 16/ Most of the farms in the flood plain area are the small family-type with low incomes.

PLANT RESOURCES

The description of the various plant communities include species of the most common plants. It is not intended to represent a detailed scientific study of the entire watershed flora. The general plant communities are discussed by forest, cropland, grassland, beaver pond, and idle land uses.

Forests

Mud Creek Watershed is located in the northern part of the southern forest region. 18/ Forest cover is not distinctive and easily separated except for the plantations of loblolly pine.

The flood plain area below U. S. Highway 31 and the upper reaches of the tributary streams are predominately covered by hardwood forest. There is great diversity of woody species in both the overstory and understory. Dominant overstory plants include water oak (Quercus nigra), southern red oak (Q. falcata), white oak, (Q. alba), sweetgum (Liquidambar styraciflua), hickories (Carya spp.), yellow-poplar (Liriodendron tulipifera), and river birch (Betula nigra).

The secondary stratum of understory woody plants includes flowering dogwood (Cornus florida), boxwood (Acer negundo), black cherry (Prunus serotina), paw paw (Asimina triloba), eastern redbud (Cercis canadensis), and smaller trees of the overstory plants. The understory includes a great diversity of shrubs, vines, legumes, grasses, and forbs. Some of the most frequent occuring plants include low panicum (Panicum spp.), purpletop (Tridens flavus), perennial lespedezas (Lespedeza spp.), honeysuckle (Lonicera japonica), greenbrier (Smilax sp.), smartweed (Polygonum pennsylvanicum), and sedges (Cyperus spp.). Other plants found near forest edges include crabgrass (Digitaria sanguinalis), Johnsongrass (Sorghum halepense), aster (Aster sp.), horseweed (Erigeron canadensis), ragweeds (Ambrosia spp.), goldenrod (Solidage sp.), broomsedge (Andropogon virginicus), and tall fescue (Festuca arundinacea).

Forest covers much of the broad flood plain above U. S. Highway 91 extending about 2 miles upstream. Dominant overstory trees include water oak, sweetgum, hickories, willow, beech (Fagus grandifolia) and blackgum. Yellow-poplar, red oak, and pine (Pinus spp.) also grow on the better drained soils of this area. The secondary stratum of trees is made up primarily of smaller trees of the dominant species. The ground cover plants consist of highly shade tolerant species. Some of the more common ground cover plants include honeysuckle, greenbrier, low panicums, sedges, and longleaf uniola (Uniola sessiliflora).

Most of the upland forest in the watershed has a mixed cover of hardwood and pine. Dominant species include red oak, white oak, hickories, sweetgum, post oak (Quercus stellata), shumard oak (Q. shumardii), yellow-poplar, loblolly pine, shortleaf pine (Pinus echinate) and Virginia pine (P. virginiana). The secondary stratum includes flowering dogwood, redbud, American holly (Ilex opaca), and smaller trees of the overstory. The ground cover varies with tree canopy and dominant tree species. Understory plants are more diverse where pine trees are dominant and where thin tree stands allow more sunlight to reach the ground.

An area of steep forest land along the west and northwest portion of the watershed has a dominant overstory of chestnut oak (Quercus prinus), post oak, hickories, and Virginia pine.

Pine plantations have been established on less than 10 percent of the upland forest area. Most of the plantings were made during the 1950's. Pine plantations are usually begun on idle cropland or pastureland. Native grasses and forbs are usually well established when the pines are planted. The native plants continue to grow until the pine canopy closes and reduces sunlight at their growth level. Only the most shade-tolerant species of the understory plants remain after the pines reach 8 to 10 years of age.

Croplands

Plant communities on cropland are almost stable systems. Cultivated crops include corn, cotton, sweet potatoes, truck crops, and a very small acreage of soybeans. Farmers use cultural, mechanical, and chemical practices to curtail the invasion of weeds; however, some weeds will occur in all cultivated crops. The kind and amount of weeds which invade crops are influenced by natural and cultural factors such as site selection, weather conditions, previous land use, and effectiveness and selectivity of chemical herbicides. Weeds that commonly invade cultivated crops include crabgrass, Johnsongrass, horseweed, pigweeds (Amarathus retroflexus, A. spinosus), lambsquarter (Chenopodium album), fall panicum (Panicum dichotomiflorum), morning glories (Ipomoea spp.), nutsedge (Cyperus spp.), and common bermudagrass (Cynodon dactylon).

Grasslands

Plants in improved pastures are mostly tall fescue, white clover (Trifolium repens), and native grasses. The most common invaders include broomsedge, ragweed, aster, goldenrod, dogfennel (Eupatorium capillifolium), and foxtail (Setaria sp.). Naturalized plants such as bermudagrass and Johnsongrass are common invaders on the better soils. Pastures on the flood plain usually contain a high percentage of water-loving weedy plants. Frequent flooding and impeded drainage conditions result in a much shorter life-span of the introduced forage plants. Invader plants in flood plain pastures include sedges, rushes (Juncus sp., Scripus sp.), barnyard grass (Echinochloa crusgalli), panicums, broomsedge, and wild paspalums (Paspalum sp.).

Idle Lands

The small areas of idle land are usually abandoned cropland which remains idle for a year or two. They are then either converted to improved pasture or are allowed to convert to forest by secondary plant succession. The early stages of plant succession appear to be very similar to typical Piedmont sites described by Oosting, 19/ Billings, 20/ and Odum. 21/ First invaders include crabgrass, horseweed, and fall panicum. Aster, common ragweed, goldenrod, poorjoe (Diodia teres), and broomsedge become dominant during the second, third, and fourth growing seasons. The grass-shrub stage includes bluestems (Andropogon spp.), goldenrod, ragweed, aster, greenbrier, blackberry (Rubus sp.), dewberry (Rubus trivialis), sumac (Rhus sp.), persimmon (Diospyros virginiana), native annual and perennial lespedeza, pine, sweetgum, oaks, and numerous other native plants.

Beaver Ponds

A portion of the flood plain, immediately above U. S. Highway 31, has been intermittently ponded by beavers over the past 10 years. The vegetation of this area is made up primarily of water-tolerant plants. Plants identified include rice cutgrass (Leerisa oryzoides), cattail (Typha latifolia), button bush (Cephalanthus occidentalis), sedges, rushes, smartweed, and black willow. Sweetgum trees are still surviving near the edge of Mud Creek. Some other aquatic plants were observed growing in the beaver ponds but they were not identified.

ANIMAL RESOURCES

Biologists from the Alabama Department of Conservation and from the U. S. Fish and Wildlife Service have stated that the fish and wildlife resources of Mud Creek Watershed are of low value. This is especially true of the flood plain area.

Approximately one mile of perennial stream flows through the project area. This low-value fish habitat supports limited populations of warm water species including sunfish, catfish, shiners, carp, suckers, and occasionally bass. The stream fishery in the watershed could potentially support 10 to 15 man-days of annual fishing per acre of perennial stream, based on the assumption that a catch of one pound per day would satisfy the demand. Fishing pressure is light, limited primarily to local residents fishing from the banks using cane poles.

Small impoundments in the watershed support good populations (100-250 lbs/acre) of largemouth bass, bluegill bream, redear sunfish, and channel catfish. Under proper management these ponds, ranging in size from 0.5 acres to 5 acres, furnish 50 to 100 man-days of annual fishing per acre. Yields in these ponds can be increased by either supplemental feeding or fertilization, or both.

Wildlife of importance include bobwhite quail, cottontail rabbit, grey squirrel, and mourning dove. Small populations of beaver, fox, raccoon, and opossum also occur. Hunting of most game is light to moderate with quail, rabbit and dove being the most popular.

There are no known rare or endangered organisms existing in the watershed.

RECREATIONAL RESOURCES

Recreation opportunities, especially water-based recreation, are available on the Tennessee Valley Authority water impoundments on the Tennessee

River, about 35 miles north of the watershed and on Smith Lake, about 15 miles west of the watershed.

It is estimated that demand for selected recreational activities, such as golf, swimming, and small game hunting, will increase tremendously by the year 2000. The percentage of the total population participating in recreational activities will also increase.

Selected recreational needs for the year 1967 compared with projected needs for north Alabama are shown below: 22/

	1967	1980	2000
Golf (courses)	13	48	178
Swimming (Sq. Ft. pool water)	510,122	1,059,942	1,749,820
Small game hunting (acres)	143,251	444,618	1,062,466

ARCHAEOLOGICAL, HISTORICAL AND UNIQUE SCENIC RESOURCES

There are no known historical sites of value existing within the watershed according to the National Register of Historic Places. Also, the Alabama Historical Commission does not list any historical sites or unique scenic areas of value within the watershed.

Recently, the Department of Anthropology, University of Alabama, studied the watershed for possible archaeological or historical sites that might be affected by the project. The results of the study indicate that no sites exist within the planned construction area (see appendix F).

SOIL, WATER AND PLANT MANAGEMENT STATUS

Land use in the watershed has been fairly stable for several years. This is mainly because the small farms do not have much flexibility in adjusting their operations.

The Cullman County Soil and Water Conservation District (S&WCD) has been providing technical assistance for land treatment throughout the county since 1940. Good progress has been made in land treatment in the watershed area; however, frequent flooding, upland erosion, small farms, and limited capital resources have become barriers to the implementation of conservation measures. These barriers result in inefficient use of land, energy, capital, and management.

The Cullman County S&WCD is active in promoting conservation measures. The district supervisors publish newspaper articles on conservation activities each week, conduct TV programs, and publish an annual district progress report. They also conduct conservation programs for schools and civic groups and sponsor an annual land judging contest for vocational agricultural students in Cullman County. The district supervisors sponsor and co-sponsor field demonstrations and tours to promote the installation of conservation measures. These activities serve to inform landowners and land users of conservation services available and of progress that has been accomplished. In addition, students and the general public are provided information on conservation of natural resources.

There are 285 units of operative agricultural land in the watershed. As of January 1975, 62 landowners or land users were cooperators with the Cullman County S&WCD, and 56 of the cooperators had conservation plans. These conservation plans cover 4,060 acres or almost 37 percent of the agricultural land in the watershed. Conservation practices that have been planned and applied under the existing ongoing program are shown below.

CONSERVATION PRACTICES PLANNED AND APPLIED

Mud Creek Watershed

Conservation Practices	Unit	Amount * Planned	Amount * Applied
Conservation Cropping System	Ac.	449	230
Contour Farming	Ac.	355	315
Crop Residue Use	Ac.	482	394
Drainage Field Ditch	Ft.	6,500	5,750
Drainage Mains or Lateral	Ft.	6,300	0
Field Border	Ft.	16,050	7,700
Grassed Waterway or Outlet	Ac.	7	5
Land Smoothing	Ac.	410	203
Pasture and Hayland Management	Ac.	1,396	1,041
Pasture and Hayland Planting	Ac.	1,091	788
Pond	No.	65	52
Terrace	Ft.	74,500	61,221
Wildlife Upland Habitat Management	Ac.	7	6
Forest Stand Improvement Cutting	Ac.	420	125
Forest Stand Improvement Treatment	Ac.	180	57

* As of January 1975.

Approximately 1,459 acres have been adequately treated by conservation practices. An additional 6,447 acres are considered to be adequately protected. Land adequately treated is defined as land being used within its capability and on which the conservation practices that are essential to its protection and planned improvement have been applied. Land adequately protected is defined as land on which the soil, water, and plant resources are adequately protected from deterioration. The status of land adequately treated and adequately protected by different land uses is as follows:

LAND ADEQUATELY TREATED

Land Use	Amount (Acres)
Cropland	230
Pasture and Hayland	1,041
Wildlife Land	6
Forest Land	182
Urban Land	-
TOTAL	1,459

LAND ADEQUATELY PROTECTED

Land Use	Amount (Acres)
Cropland	250
Pasture and Hayland	3,000
Wildlife Land	6
Forest Land	3,950
Urban Land	700
TOTAL	7,906

PROJECTS OF OTHER AGENCIES

The City of Hanceville is presently working to make flood insurance available to its residents through the Housing and Urban Development Agency's Flood Insurance Program administered by the Federal Insurance Administration.

In order to qualify for the Flood Insurance Program, the city will be required to adopt zoning ordinances to control damage in the flood hazard area. These ordinances will help prevent the location of improvements in the flood plain which are susceptible to flood damages.

WATER AND RELATED LAND RESOURCE PROBLEMS

LAND AND WATER MANAGEMENT

Many farmers do not have the financial resources to install conservation measures at the rate they are needed. Low income landowners or operators of small farms are more inclined to use intense cropping systems that exceed the capability of the land.

Landowners and operators on small farms have less flexibility in adjusting to different crops and different land uses as supply and demand for agricultural products tend to make such changes more desirable. The shifting of crops and land uses always brings on demands for changes in farm equipment and facilities. Owners of small farms usually cannot make efficient use of additional equipment; they generally purchase equipment for a certain farm system and continue with that same equipment year after year.

Many upland soils in the watershed are shallow to moderately deep, naturally infertile, and subject to high erosion rates. The soil depth limits the amount of available soil moisture for plant use, restricts root systems of plants, and influences the amount of erosion that can be safely tolerated. Low natural fertility necessitates a more exacting fertilizer management program. The wearing away of top soil by excessive erosion results in deterioration of the soil resource base. Many fields are small, have irregular boundaries, and are difficult to work because of the natural topography. Farmers will often enlarge their fields and include areas with soils that are not well suited to the crops or land uses for which the fields are being used.

The above problems contribute to inefficient use of land, energy, capital, and management. Many areas used for cultivated crops should be converted to other land uses. Most of the upland soils are well suited to grassland and forest; however, these uses do not return sufficient income on small farms.

Other agricultural studies of the general area have recognized several barriers to solutions of agricultural problems and potentials. 24/ Barriers that apply to some extent in Mud Creek Watershed include (1) limited management ability of farmers to apply new technology, (2) improper land use, (3) limited farm size, (4) human and cultural restraints that limit ability to change, and (5) inadequate markets for some agricultural products. The watershed program should help overcome some of these problems by providing technical assistance to improve technology and reduce the amount of improper land use.

Landowners and land users in the watershed understand the need for conservation land treatment. The small size of farms will continue to be a restraint in the solution to some conservation problems. It is recognized that farmers are not yet ready or able to apply all of the conservation treatment needed. Nevertheless, they have demonstrated their ability to apply conservation measures at a satisfactory rate and do a good job of maintaining practices after they are applied.

The Alabama Forestry Commission, through the various Federal-State cooperative forestry programs, is providing forest management assistance, forest fire prevention and suppression, distribution of planting stock, and forest pest control assistance to landowners.

FLOODWATER DAMAGE

Damaging floods occur along Mud Creek from two to eight times each year. Two to four of these floods occur during the agricultural cropping season (April through November). Floodwaters damage pastures and reduce quality and quantity of grazing. Pasture quality and grazing time are lost. Fences and cattle gaps are frequently destroyed. The constant flooding problem has caused much of the 600-acre flood plain to be used for pasture or forest. Small, frequent floods cause most of the agricultural damages with most damages occuring in the spring. Row cropping in the flood plain has become unfeasible.

Floodwater damages to roads and bridges cause the county additional expenses for repair every year. Bridges are often washed out or foundations damaged. Gravel and dirt roads are damaged by inundation and eroding of fill material.

Damaging floods in the urban area occur an average of 2 to 5 times per year. These floods cause minor damages to six houses and four commercial buildings. Flooding has caused much of the urban area to remain idle. The city of Hanceville has lost two industries because the buildings and surrounding areas in which the industries were to locate are subject to flooding.

In addition to lost industries, flooding causes a health hazard. When Hanceville's sewage treatment plant is flooded, the electric motors become inoperable and raw sewage is released into Mud Creek. During each of the last 5 years floodwaters have overloaded the sewage treatment plant motors causing them to burn out. This has caused the city considerable expense and inconvenience. In other cases, floodwaters fill the lines and manholes leading into the plant; raw sewage escapes through the manholes and is deposited on the flood plain.

Flooding of pastureland along Mud Creek within the city limits of Hanceville.

A county road east of Hanceville is being flooded by a 5-inch rainfall that occurred in May 1969.

Shown below are acreages and depths of flooding by various frequency storms:

STORM FREQUENCY	ACRES FLOODED WITHOUT PROJECT DEPTH INCREMENT (FEET) 0-1	1-3	3+	TOTAL
0.3-year	177	19	0	196
0.5-year	247	40	0	287
1-year	303	92	4	399
5-year	278	195	44	517
25-year	215	268	83	566
100-year	145	298	157	600

The preceding table indicates that a storm occurring on an average of three times per year floods one-third as much area as a storm occurring an average of one time in 100 years. A one-year storm floods two-thirds as much area as a 100-year storm, etc.

The stream reach from the lower end of planned channel work (see station 258+60, appendix B) to the confluence of Mud Creek and the Mulberry Fork of the Black Warrior River is a gorge and there is little or no damage from flooding.

The majority of the agricultural damage occurs in evaluation Reach II. Evaluation Reach I is more urbanized.

Annual flood damage to crops and pastures is estimated at $2,250. Other damages include residential and commercial $1,900; roads and bridges $3,700; other agricultural $3,350, and indirect $1,600.

Flooding does not pose a threat to the lives of people in the area; however, a health problem could develop when the sewage treatment plant becomes flooded and raw sewage spills onto the flood plain.

EROSION DAMAGE

Based on estimates using the Universal Soil-Loss Equation, gross erosion rates for the watershed under present conditions are as follows:

Cropland	7.99 tons/acre
Pastureland	.71 tons/acre
Forest land	1.84 tons/acre
Urban land	.81 tons/acre

Gully, roadside, and streambank erosion in the watershed is insignificant. There are no significant critical sediment-producing areas in the watershed.

Flood plain erosion is not a major problem, but some minor scour channels exist on the flood plain. These scour channels remove productive soil and cause a reduction in plant quality and productivity. Several years may be needed for farming operations and natural processes to rebuild fertility and smooth the scoured land. Scouring damages 12 acres of flood plain, and productive capacity is reduced by 5 to 20 percent.

Sheet erosion causes practically all the erosion damage in the uplands. Sheet erosion causes a reduction in soil fertility and exposes the less fertile, more easily eroded subsoil to attack by wind and water. Average gross erosion on the upland cropland is greater than the maximum soil-loss tolerance. Productivity cannot be sustained economically for an indefinite period if the present rate of erosion continues.

There is a need for land use adjustments in the uplands. Areas which are now being used beyond their capabilities should be changed to a use which is compatible with productive capability. Soils and slopes generally determine the capabilities of a given area.

SEDIMENT DAMAGE

Field studies revealed that damages from sediment are low. These damages occur on about 1.5 acres of flood plain in the central portion of the watershed southeast of Hanceville. The sediment is a widespread, fine-grained material which is less productive than the underlying soil. Since this is a forested area, damage is insignificant.

Storm runoff has a high concentration of suspended sediment, especially during periods of land preparation. Sedimentation in field and road ditches occurs where slope or vegetation reduces the velocity of runoff water and can be prevented by proper maintenance.

Average annual sediment yield at the mouth of the watershed is about 8,000 tons or 246 milligrams per liter. Under exisiting conditions, the sediment concentration level is fairly low but is outside the range for a good stream fishery. 25/

DRAINAGE PROBLEMS

Drainage is not a significant problem in the watershed. There are about 145 acres which have a wetness problem. These areas are located throughout the watershed, but generally occur on Taft, Roanoke, and Chewacla soils.

Drainage problems effect quality, production costs, and yields of cultivated row crops. Land preparation, planting, cultivation, and harvesting are delayed and often difficult to perform due to prolonged wetness of the soil.

Poor drainage limits the species of pasture plants that can be grown and almost always intensifies weed problems. Grazing periods are restricted during periods of prolonged wetness.

The principle problem on forest land, as a result of poor drainage, is the restriction of some tree species that can be grown.

The existing capacity of Mud Creek and its tributaries is adequate to allow individual landowners to install on-farm drainage systems.

VECTOR PROBLEMS

During flooding conditions, floodwaters become trapped in beaver impoundments adjacent to the main channel (about 20 acres) near Hanceville. Floodwaters stand for days in this area causing a favorable mosquito breeding and hatching site. After mosquitoes hatch they infest the nearby Hanceville area presenting a health hazard and an expense for their control. It is estimated that approximately 200 families incur above average expenses for mosquito control. During 1975 one person living in the watershed died from encephalitis as a result of a mosquito bite.

RECREATION PROBLEMS

Existing water-based recreational opportunities are adequate for present demand within the watershed. Tennessee Valley Authority impoundments on the Tennessee River are available for fishing, skiing, swimming, etc.

Mud Creek is not suitable for water-contact sports because of its size and city sewage effluent. Mud Creek does support some stream fishery (10-15 man-days per acre per year), but city sewage causes contamination in the lower reaches. Small game hunting is available, especially in the uplands.

A population of about 30,000 live within 15 miles of the watershed. This population is projected to increase by 40 to 50 percent in the next ten years. With an increasing population and an increasing percentage of the population participating in outdoor recreation, it is expected that recreation supply will not satisfy demand in the area.

PLANT AND ANIMAL PROBLEMS

Land use trends in the watershed have been fairly stable for the past few years. The slight changes that occur have only a small effect on changes in plant communities. The plant community associated with the beaver ponds continues to increase in size but at a very slow rate.

Fish and wildlife habitat have suffered from the pressures of residential development in rural sections of the county. The land in the watershed and surrounding area is characteristically in small, private ownership; therefore, hunting and fishing opportunities are limited and are decreasing rapidly. While there is a need for more public fishing and hunting, there is also a growing need to preserve and develop habitat for fish and wildlife.

WATER QUALITY PROBLEMS

Treated sewage from the Hanceville sewage treatment plant enters Mud Creek below U. S. Highway 31. Flooding of the treatment plant has caused raw sewage overflows. City sewage renders the creek unusable for water contact sports below U. S. Highway 31. There are no water quality records for Mud Creek.

ECONOMIC AND SOCIAL PROBLEMS

The small family farm is the primary source of livelihood. There are 285 farms or parts of farms in the watershed averaging about 39 acres per farm. Most of these farms are low-income units with supporting income derived from off-farm employment.

Approximately 51 percent of all farms in Cullman County had annual gross sales of less than $2,500 per 1969 Census. 23/ Farms in the watershed are typical of farms throughout the county. None of the farms in the watershed utilize as much as one man-year of hired labor annually.

Incentives for good pasture and cropland management in the flood plain are vastly reduced as a result of flooding. Land use has also been restricted. Fields that were once used for crops have long since changed to pasture or forest to avoid crop losses.

The city of Hanceville has lost prospective industries primarily because of flooding. One industry was to utilize some warehouses southwest of town in the edge of the flood plain but abandoned the consideration because of the likelihood of flood damages.

Employment opportunities and chance for improvement for the people in the watershed are small. There is a definite need for increased employment opportunities, and for urban and rural development.

RELATIONSHIP TO LAND USE PLANS, POLICIES, AND CONTROLS

There are no federal, state, or local land use plans, policies, or controls in effect for Cullman County, Alabama at the present time.

ENVIRONMENTAL IMPACT

CONSERVATION LAND TREATMENT

During the installation period, conservation land treatment will be applied to the watershed lands resulting in 1,420 acres becoming adequately treated and 2,110 acres becoming adequately protected. A majority of the remaining land will have some land treatment measures applied. At the end of the installatlion period, 2,879 acres in the watershed will be adequately treated and 10,016 acres will be adequately protected.

Following the installation of planned land treatment measures, the estimated average gross erosion rates will be reduced, based on the Universal Soil-Loss Equation, as follows:

LAND USE	SOIL-LOSS (Tons/Acre)		REDUCTION (Percent)
	W/O Project	With Project	
Cropland	7.99	5.85	27
Pastureland	.71	.46	35
Forest land	1.84	1.28	30
Urban land	.81	.80	1

The existing sediment accumulation on 1.5 acres of forest land in the central part of the watershed will be reduced by 33 percent with land treatment in the uplands.

Farmers will increase crop production on lands where conservation practices are applied. The land will retain more water for plant use 33/ and soil losses from erosion will be reduced. Soils will have improved physical conditions, nutrient supply, and biological activities. Conservation planning will result in the use of plants that are better suited to the soil conditions. Pastures and cultivated row crop yields will be increased on the flood plain because the project will reduce flooding and make it practical to install some needed drainage practices.

Average annual sediment yield at the mouth of the watershed will be reduced from 8,000 tons to 5,400 tons, a reduction of 33 percent. Sediment concentrations will drop from 246 milligrams per liter to 166 milligrams per liter. This concentration level remains outside the range for good stream fisheries. 25/

Technology does not permit making valid quantitative estimates of plant nutrient and agricultural chemical transfers from soils to ground and surface waters. Much research has been done however, on the movement of fertilizers and agricultural chemicals that are applied to soils. The results of such research permit qualifying most of the impacts of land treatment measures.

The planned land treatment program should not significantly increase the use of pesticides and chemical fertilizers. Farmers are generally using more pesticides and chemical fertilizers to promote more efficient farming; however, croplands, where most of these materials are used, will decrease in the watershed when the project is installed. The higher application rates and the reduced acreage should result in a somewhat stable use of pesticides and fertilizer on cropland. There will probably be a small increase of fertilizer use on pasture and hayland.

Conservation practices to be applied do not require excessive use of pesticides for their installation or maintenance. The technical assistance provided to farmers during the conservation planning phase will emphasize soil testing to determine application rates of fertilizer and lime. Technical personnel will also encourage proper application and use of commercial fertilizers and animal wastes.

Nitrogen and phosphorus are the fertilizing elements most frequently related to water quality. The nitrate anion is highly soluble and is readily transferred by water movement. 35/ Nitrogen is lost by soil erosion, surface runoff, and leaching. 27/ 36/ The critical period when nitrate is most susceptible to leaching to ground water is when crops are not present or not actively growing. 27/ It is estimated that, over the United States as a whole, each ton of sediment contains about 2 pounds of nitrogen. 35/ Water leaving agricultural land, even if sediment free, may contribute nitrates to surface water. 37/

There is much evidence to indicate that phosphorus losses are associated almost entirely with soil erosion. 35/ 27/ 38/ 31/ 40/ Studies in South Carolina on a soil with a very high leaching potential indicate that very little phosphorus enters drainage water in solution. 40/ Water soluble phosphates in fertilizers dissolve rapidly in the soil solution and react to form less soluble or insoluble compounds. 39/

Chemical pesticides escape from the soil into the environment through water movement, soil erosion, drift, and volatilization, and through the removal of plants by animals and man. 41/ Pesticides pass into water systems primarily by: (1) moving with eroded soils, (2) becoming dissolved in runoff waters, (3) drifting in the air, or (4) being

accidently sprayed on to surface waters. The many different chemical formulations and properties make it difficult to even generalize on their fate in soil and environment; however, some of the formulations that present potential danger are being replaced by less harmful compounds. Pesticide movement by surface waters present the greatest hazard since their movement to other areas becomes almost certain. Pesticide solubility, absorption by soil, and degradation in soil by chemical and microbial actions severely limits either building-up in the soil or leaching to ground water. 37/ 40/ 43/

In general, those land management practices that minimize soil erosion and surface runoff will also reduce the hazard of water contamination from pesticides and plant nutrients. 35/ 36/ 38/ 39/ Train 44/ suggested that the implementation of conservation practices would be an enormous step toward a healthier environment. Croplands with conservation farming systems consistantly produce less runoff and erosion than croplands without conservation systems. 37/ 45/ 46/ Conservation practices such as grassed waterways, terraces, conservation cropping systems, and the planting of grass and legumes have proven to be very effective in reducing the movement of pesticides and plant nutrients. 35/ 37/ 38/ 31/ 39/ 40/ 46/ 47/ 48/ 49/

The expected changes in land use after project installation are as follows:

LAND USE	PRESENT (AC.)	FUTURE WITH PROJECT (AC.)
Cropland	2,350	2,150
Pasture and Hayland	3,720	4,170
Forest Land	4,940	4,650
Urban Land	740	780

Based on hydrologic calculations, the direct runoff throughout the watershed will be reduced by about 5 percent as a result of conservation measures.

In addition, ground water storage is expected to increase by about 5 percent during periods of wet weather. This increased storage will be temporary, and water will return to the streams during periods of low flow.

Conservation measures will have an effect on the aesthetics of the watershed. The installation of conservation practices on upland soils will result in lines, forms, and patterns that are in harmony with the natural landscape.

Approximately one mile of low-value perennial stream fisheries will be altered by channel work. This will result in a potential loss of 10 to 15 man-days of stream fishing for 5 to 10 years. Increased sediment during project installation will temporarily alter stream habitat for an additional 1 to 2 miles.

Wildlife habitat should suffer only a minor reduction in carrying capacity although croplands may be reduced by 200 acres and forest land by 290 acres. It is anticipated that pastureland will increase by 450 acres. Although land use changes will reduce habitat for some forest and farm game, wildlife plantings on individual land units will partially offset this reduction.

Beaver populations will be displaced by channel construction and maintenance. Beaver dams will be removed, thereby allowing unrestricted streamflow. Beaver impoundment areas will be removed along with some wildlife habitat. Sediment that was trapped by the beaver dams will be allowed to move downstream.

Channel work and the resulting flood protection should return 73 acres of the flood plain to agricultural production. It is estimated that 66 acres will be used for pasture, and 7 acres will be used for corn. This land is presently in low-quality forest or idle land.

A bridge on a dirt, county road at station 74+80 will be replaced. Though the road will be closed during construction of the bridge, little disruption of traffic or inconvenience to local residents will occur since other routes of travel are readily available. The proposed channel work will not disturb nor create a potential disturbance to existing roadway embankments at Alabama 91, U. S. 31, or any other State or Federal roadway. If, however, a potential threat is determined, appropriate protective measures will be applied.

Shown below are acres by depth that would be flooded with and without the project based on storms of various frequencies.

	ACRES FLOODED							
	WITHOUT PROJECT				WITH PROJECT			
STORM	DEPTH INCREMENT (FEET)				DEPTH INCREMENT (FEET)			
FREQUENCY	0-1	1-3	3+	TOTAL	0-1	1-3	3+	TOTAL
0.3-year	177	19	0	196	0	0	0	0
0.5-year	247	40	0	287	0	0	0	0
1-year	303	92	4	399	164	36	2	202
5-year	278	195	44	517	271	116	32	419
25-year	215	268	83	566	231	202	62	495
100-year	145	298	157	600	161	279	97	537

The project will eliminate flooding caused by storms of 0.5-year frequency, 24-hour duration and all smaller storms.

Streambank erosion along the existing channel is not a major problem. Erosion will increase during and immediately after construction of the new channel, but will decline and the channel will become stable during the establishment period.

Streambank erosion could occur on about 15 acres as a result of channel work. For a period of one year following construction, an estimated 50 tons of sediment per acre will be produced. This will result in an increase of 750 tons of sediment at the mouth of the watershed.

Flattened side slopes (3:1) rock drop structures, and vegetation will stabilize channel bank erosion at an estimated 6 tons per acre per year after the first year. Future erosion, after installation of the channel work and land treatment, will yield about 5,500 tons (169 mg/l) of sediment annually at the mouth of the watershed. This figure represents a 31 percent net reduction in sediment leaving the watershed.

As a result of out-of-bank flow, scour damage is now occuring on twelve acres of the flood plain. Following channel work, these twelve acres will return to their original productive capacity in about 5 years.

The structural measures planned for the watershed will not have a significant impact on the plant communities of the area. Reduced flooding will result in a reduction of water-tolerant weedy plants in pastures.

Channel construction will result in a loss of 69 acres of flood plain forest; however, there should be no significant change in plant composition of the remaining forest land.

With the elimination of forest cover along the stream there is a possibility of a slight increase in water temperature during hot dry periods. An increase in water temperature would reduce the assimilative capacity for oxygen thereby reducing the ability to oxidize pollutants.

There are no water impoundments located on the streams designated for channel work. The proposed channel work will not have an effect on any domestic, municipal, or industrial water supplies, nor will it penetrate any recognized aquifers. Neither the channel work nor the drainage laterals as a land treatment measure will have a significant effect on ground water resources.

Based on data transposed from the Dorsey Creek stream gage, Mud Creek should be without flow for about 7 consecutive days each year in the vicinity of the lower end of planned channel work. However, the stream is perennial from the Hanceville sewage treatment plant downstream because of the release of treated sewage into the channel. The planned channel work is not expected to affect the base flow of Mud Creek.

Air pollution from dust and exhaust emissions will increase during construction. Every effort will be made to prevent injury to plants, animals, and property. Construction roads and other frequently disturbed areas will be sprinkled or otherwise treated to control dust. Problems involving air quality and noise pollution will be temporary since structural measures will be installed within a 2-year period.

There will be an increase in both the acreage flooded and depth of flooding from immediately above the lower end of planned channel work (approximate station 250+00, appendix B) downstream for approximately 17,000 feet to the confluence of Mud Creek and the Mulberry Fork of the Black Warrior River. This reach is a wooded gorge and, though there will be an increase in flooding because of upstream channel work, there will be practically no damage. The area expected to be flooded by a 100-year storm will increase from approximately 80 to 86 acres with about an 0.8 foot increase in depth.

Storms with an expected frequency of occurrence of once in 10 to 100 years cause flooding of a driveway and lawn at a farmstead approximately 1,000 feet downstream from a county road (station 275+80, appendix B). With project, depths of flooding for various frequency storms will be approximately 0.8 foot greater than those without the project in the vicinity of the farmstead. Land rights will be provided by the sponsors prior to construction to offset any possible induced damages caused as a result of the project. This has been mutually agreed to by the landowners and the sponsors.

Mud Creek begins to meander near the west corporate limit of Hanceville, and there is minor to appreciable meandering downstream to about 1,000 feet below the Louisville and Nashville Railroad. Flow through this stream reach is intermittent except in the lower one-half mile; the flow becomes perennial where the Hanceville sewage treatment plant discharges into the stream. The channel will be realigned slightly through the perennial stream reach. Two short oxbows, one above and one below the L&N Railroad, will be filled with material excavated during channel work. Channel work will not affect the sewage treatment plant.

The project will increase the real estate tax base, especially on the 73 acres made available for agricultural use. This increased tax base will help provide additional funds for a higher standard of living. Approximately 20 acres of urban property will no longer be flooded from the 100-year storm.

The planned channel work will eliminate mosquito breeding areas caused by occasional flooding. Frequent floods which produce the breeding areas will be eliminated thus the mosquito problem will be greatly reduced.

ECONOMIC AND SOCIAL

After project installation, farmers will be able to utilize more intensive farming methods and operate on a more timely basis. Fertilizers and agricultural chemicals can be used more efficiently, thereby increasing yields and incomes.

The residents of the city of Hanceville will spend less for mosquito control. This will improve health conditions and will also make more funds available for other purposes.

Channel construction will create about 9 man-years of local labor during the 2-year installation period. Maintenance of the channel will provide part-time employment each year during the 100-year life of the project.

The project will reduce flooding of the sewage treatment plant and sewage lines. Hanceville will pay less for repairs to sewage pumps, and fewer sewage spills will improve water quality.

FAVORABLE ENVIRONMENTAL IMPACTS

The favorable environmental impacts are summarized as follows:

1. The project will result in an estimated 1,420 acres of land being adequately treated during the installation period. This includes 200 acres of cropland, 900 acres of pastureland, 20 acres of wildlife land, and 300 acres of forest land.

2. The conservation land treatment practices used to control erosion will reduce the mode of transportation for nitrogen, phosphorus, and other agricultural chemicals into the streams.

3. There will be a 31 percent reduction in average annual sediment leaving the watershed following project installation.

4. Scour damages will be reduced on 12 acres of the flood plain.

5. The installation of conservation practices on upland soils will improve the aesthetics of the watershed by creating lines, forms, and patterns that are harmonious with the natural landscape.

6. The fire control program will help prevent forest fires.

7. The project will reduce road and bridge damages.

8. The project will increase the real estate tax base and provide greater revenues.

9. About 73 acres will be made available for agricultural production.

10. Urban expansion will be provided on 20 acres by protection of flooding from the 100-year event.

11. The project will eliminate a mosquito breeding habitat and improve health conditions around Hanceville.

12. The channel construction will create 9 man-years of employment of local labor.

13. Reduced flooding of a sewage treatment plant will result in less sewage spills and improve water quality.

14. Flooding will be reduced on about 550 acres of agricultural land and about 50 acres of urban land.

ADVERSE ENVIRONMENTAL IMPACTS

The adverse environmental impacts are summarized as follows:

1. Approximately 1 mile of perennial stream fishery habitat will be altered by channel improvement resulting in a loss of 10-15 man-days of stream fishing for 5 to 10 years.

2. The channel work will result in increased sedimentation and stream turbidity during and immediately after construction.

3. The construction of the channel will result in a loss of 69 acres of flood plain forest.

4. There is a possibility of an increase in stream temperature during hot dry periods.

5. If stream temperature is increased, then the assimilative capacity of the stream for absorbing wastes would be reduced and pollution would be carried further downstream.

6. Air and noise pollution will be increased temporarily during construction.

7. There will be an increased nuisance from flooding at a farmstead downstream from the channel work.

ALTERNATIVES

Alternatives to the proposed project:

(1) Accelerated Conservation Land Treatment
(2) Accelerated Conservation Land Treatment and Flood Plain Zoning
(3) Accelerated Conservation Land Treatment and Two Floodwater Retarding Structures
(4) Accelerated Conservation Land Treatment, a 10-year Urban Channel, and a 0.75-year Agricultural Channel
(5) No Project

(1) Accelerated Conservation Land Treatment

Accelerated land treatment could be installed without the structural measures. This treatment is described in the "Planned Project" section.

Accelerated land treatment would reduce the average annual floodwater damage by about $300 and would reduce the erosion on the uplands. The average annual sediment yield would be reduced by about 33 percent, and the average annual erosion would be reduced as follows:

EROSION REDUCTION WITH ACCELERATED LAND TREATMENT

Land Use	Percent Reduction
Cropland	27
Pastureland	35
Forest land	30
Urban land	1

Wildlife food and cover would also be improved. Total cost of this alternative is $214,200.

(2) Accelerated Land Treatment With Flood Plain Zoning

Accelerated conservation land treatment could be installed along with flood plain zoning. Flood plain zoning would offer no further relief from agriculture damages. Flood and sediment damages would be reduced about one percent. The city of Hanceville would be zoned to regulate future land use and restrict development in the flood plain.

Urban zoning would not reduce flood damages to urbanized properties already in the area. It would, however, eliminate additional damages by restricting development in affected areas. Urban flood damages to present developments are not a serious problem in terms of monetary losses; however, they are a nuisance to the community.

The estimated total installation cost of this alternative is $215,000.

(3) Accelerated Conservation Land Treatment and Two Floodwater Retarding Structures

The accelerated conservation land treatment would be the same as in the proposed project. To this would be added two floodwater retarding structures. The two floodwater retarding structures would temporarily store the runoff from about 11 percent of the drainage area. This alternative would reduce peak flood flows downstream and reduce damages by about 11 percent. The sediment pools of the floodwater retarding structures would also provide added fishery habitat.

Thirty-one additional acres would be required to install this alternative: 13 acres for floodwater detention pools and 18 acres for dams, spillways and borrow areas. Twenty-four acres of forest land would have to be cleared.

This alternative would cost an estimated $414,200. This includes $214,200 for land treatment and $200,000 for floodwater retarding structures.

(4) Accelerated Conservation Land Treatment, a 10-year Urban Channel, and a 0.75 year Agricultural Channel

Accelerated conservation land treatment would remain the same as in the current plan. This channel would require about 5.3 miles of channel excavation. The maximum top width of the channel would be 136 feet with side slopes of three horizontal to one vertical. To install the channel, about 190 acres of forest land would need to be cleared and about 113 acres of permanent right-of-way committed to the channel. This channel would provide an estimated $38,000 in average annual benefits and would have an average annual cost of about $77,600. The channel would occupy about 20 percent of the flood plain.

This alternative would cost an estimated $1,326,900, including $214,200 for land treatment and $1,112,700 for channel work.

(5) No Project

Under this alternative, there would be no accelerated land treatment program, but the ongoing land treatment program would continue. Land-

owners would eventually install land treatment measures to maintain soil productivity. Since the measures would be delayed, the impact of these measures in reducing erosion and sediment damages would also be delayed.

Flooding would continue, resulting in floodwater and erosion problems.

Agricultural damages in monetary terms would continue to increase as prices for farm products rise.

The average annual sediment yield at the mouth of the watershed would be reduced by 10 percent.

This alternative would not require any land clearing or channel excavation. All resources would be allowed to remain in their present condition. Estimated net annual benefits of $6,700 will be forgone.

SHORT TERM VS. LONG TERM USES OF RESOURCES

The proposed watershed project will encourage greater agricultural use of land in the flood plain and will encourage better agricultural management. Conservation land treatment will protect the soil and help conserve its productivity for future generations. The project will reduce flood problems immediately and, with planned maintenance, will increase options for flood plain use for future generations.

Mud Creek watershed will have no cumulative environmental effect in conjunction with any other water resource project. The project will have little cumulative environmental effect on the Tombigbee Water Resource Subarea.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

Thirty-one acres of land will be permanently committed for the actual installation of the channel work. This land is included as part of the 145-acre right-of-way and the 52 acre permanent easement needed for the project. Land use of the area committed to channel work is as follows:

LAND COMMITTED TO CHANNEL WORK

Land Use	Acres
Existing Channel	14
Pastureland or Idle land	3
Forest land	14
Total	31

This land will be occupied by the channel so that flood damage can be reduced on the remaining acreage. It is estimated that increased agricultural production on the surrounding flood plain will more than offset production lost on areas committed to the project.

CONSULTATION AND REVIEW WITH APPROPRIATE AGENCIES AND OTHERS

GENERAL

The sponsors of the Mud Creek Watershed project initiated action for a project by applying for planning assistance to the Alabama State Soil and Water Conservation Committee. Their application was approved in September 1969 and preliminary investigations were then begun.

On April 14, 1970, members of the watershed planning staff met with the sponsors to discuss problems, objectives, and flood plain zoning in the urban area.

A preliminary investigation report indicating a feasible plan for watershed protection and flood prevention was presented to the sponsors on May 5, 1970.

Application for detailed planning assistance was made to the administrator of the Soil Conservation Service in May 1970. Planning was authorized and was begun in July 1970. Federal and State agencies were informed by letter of this action and their assistance was requested.

On January 7, 1971 a field review of the watershed was held by representatives of the U. S. Fish and Wildlife Service, Alabama Department of Conservation, and Soil Conservation Service. A report was later provided to the Soil Conservation Service from the U. S. Fish and Wildlife Service stating that "the project will not significantly affect fish and wildlife resources of the area". The Alabama Department of Conservation concurred with the report.

A public meeting was held on October 16, 1971, attended by 35 persons representing Federal, State, and local agencies, the Alabama Archaeological Society, State Highway Department, sponsors, and interested individuals. It was recognized that some historical sites might exist along the creek, but no opposition to the project was voiced. An archaeological and historical study was made by the Department of Anthropology of the University of Alabama in June 1974. Copies of a report resulting from this study were furnished to the State Preservation Officer and the Alabama Historical Commission. Summary and Conclusions of the study is attached as appendix F.

Implementation of the National Environmental Policy Act (NEPA) of 1969 required project re-evaluation resulting in a modified proposal.

Results of the new study were presented to and accepted by the sponsors on February 27, 1975.

The U. S. Forest Service provided information concerning project environmental effects on forest land in the watershed. Forest Service inputs are reflected wherever forest land is discussed.

DISCUSSION AND DISPOSITION OF EACH COMMENT ON THE DRAFT EIS

Comments Requested	Comments Received
Department of Agriculture	
Office of Equal Opportunity	
Department of the Army	X
Corps of Engineers	X
Department of Commerce	X
Department of Health, Education and Welfare	
Food and Drug Administration	
Department of Housing and Urban Development	X
Department of the Interior	X
U. S. Fish and Wildlife Service	
U. S. Bureau of Mines	
Bureau of Outdoor Recreation	
National Park Service	
Department of Transportation	X
U. S. Coast Guard	X
Environmental Protection Agency	X
Advisory Council on Historic Preservation	
Federal Power Commission	
Alabama Attorney General	
Alabama Development Office	
Soil and Water Conservation Committee (also Governor's designated representative	X
Alabama Department of Conservation and Natural Resources	
State Health Department	X
Birmingham Regional Planning Commission	
Alabama Forestry Commission	
Alabama State Geologist	
Alabama State Highway Department	X
Alabama State Department of Education	
Alabama Commissioner of Agriculture	
Alabama Historical Commission	
Alabama Water Improvement Commission	
Alabama Association of Soil and Water Conservation Districts	
Auburn University, Cooperative Extension Service	
Auburn University, Alabama Cooperative Fisheries Unit	

University of Alabama, Department of Anthropology
University of Georgia, Department of Agricultural Economics
Natural Resources Defense Council
National Wildlife Federation
Alabama Wildlife Federation
Environmental Defense Fund
Environmental Impact Assessment Project
Friends of the Earth
National Audubon Society
Alabama Archaeological Society
The Alabama Conservancy
Sierra Club
Alabama Sportsman Conservation Club
Bradley, Arant, Rose, and White; Attorneys
Richard K. Smith, Birmingham, Alabama
Bob Truett, Birmingham, Alabama X

Summary of Comments and Responses

Each issue, problem, or objection is summarized and a response given on the following pages. The letters of comments are attached as appendix C.

U. S. Department of the Army

Comment Summary: The Draft Environmental Impact Statement satisfies the requirements of Public Law 91-190 and the Draft Plan does not conflict with any projects or proposals of this Department. Regulatory permits from the Corps of Engineers will be required for the project.

Response: Noted. All applicable state and federal laws and regulations will be complied with in the installation, operation and maintenance of the project.

U. S. Department of Commerce

Comment Summary: The climate description would be enhanced by including information on flood producing weather systems. Information such as frequency and duration of storms that produce flooding would be helpful.

Response: This information has been added under WATER AND RELATED LAND RESOURCE PROBLEMS section, Floodwater Damage subsection.

Comment Summary: Frequency and duration data are found in U. S. Weather Bureau Technical Paper No. 40.

Response: Data was used from this publication during watershed evaluation procedures.

U. S. Department of Housing and Urban Development

Comment Summary: Upon review of the EIS no basis was found for formal comment because of special HUD interest or expertise.

Response: Noted.

U. S. Department of the Interior

Comment Summary: It is stated that a wetland area should not be altered by channel work yet construction practices and maintenance in this area are not fully explained.

Response: The PLANNED PROJECT section has been modified to omit the statement that the wetland area would not be altered. The PLANNED PROJECT section, Operation and Maintenance subsection has been modified to include controlling beaver dams as a maintenance measure.

Comment Summary: Storm frequency and resulting depth of flooding occuring in the project area should be assessed.

Response: Depths of flooding for various frequency storms has been included in the WATER AND RELATED LAND RESOURCE PROBLEMS section.

Comment Summary: It should be noted that the area's coal reserves are limited to the higher elevations and that no significant minerals are known to occur in the immediate area.

Response: Additional information has been included in the ENVIRONMENTAL SETTING section, Mineral and Ground Water Resources subsection.

Comment Summary: Flood protection measures for the sewage treatment plant should be considered in order to minimize water quality problems.

Response: The proposed project will effectively reduce the flood problem at the sewage treatment plant and will also reduce flooding of sewage lines and manholes. Manholes can be raised by the city if necessary.

Comment Summary: The statement should address the matter of any changes in point(s) of effluence considering attendant water level and ground water discharge effects.

Response: The ENVIRONMENTAL IMPACT section has been modified to show that the proposed channel work will not have a significant effect on ground water resources.

Comment Summary: The statement should indicate any impacts of the proposed drainage ditches on ground water resources.

Response: Drainage ditches are planned as a conservation land treatment measure. The ENVIRONMENTAL IMPACT section has been modified to show that these drainage ditches should not have a significant effect on ground water resources.

U. S. Department of Transportation

Comment Summary: No comments nor objections to the project.

Response: Noted.

U. S. Environmental Protection Agency

Comment Summary: Removal of vegetation along the stream will increase water temperature during hot dry periods.

Response: The ENVIRONMENTAL IMPACT section has been modified to include this effect.

Comment Summary: An increase in water temperature will reduce assimilative capacity for oxygen and therefore reduce ability to oxidize pollutants.

Response: The ENVIRONMENTAL IMPACT section has been modified to include this effect.

Comment Summary: Construction involving the sewage treatment plant should be in accordance with Alabama Water Improvement Commission procedures and have their approval.

Response: It is not anticipated that construction will involve the sewage treatment plant (this has been noted in the ENVIRONMENTAL IMPACT section). If, however, final plans and specification should involve the treatment plant, Alabama Water Improvement Commission procedures will be followed.

Comment Summary: Open burning must be carried out in accordance with state and local regulations.

Response: Concur, this is stated in the PLANNED PROJECT section.

Alabama State Soil and Water Conservation Committee

Comment Summary: The proposed development will enhance rather than degrade the project area environment.

Response: Noted.

Comment Summary: Expediting the project will be appreciated.

Response: Noted.

Alabama Department of Public Health

Comment Summary: No adverse comments, provided the construction of drainage ditches and discharge waters do not affect the proper functioning of sewage disposal systems within the area.

Response: The drainage ditches will be installed by individual landowners as a land treatment measure and will not affect any sewage disposal systems within the area.

Comment Summary: Proper drainage can be very effective in relieving many of the problems experienced in the way of flooding at the Hanceville sewage treatment plant.

Response: Noted.

Alabama Highway Department

Comment Summary: If the channel work should create a potential threat to roadway embankments at Alabama 91 and U. S. 31, appropriate embankment protection should be applied.

Response: The ENVIRONMENTAL IMPACT section has been modified to show that channel work will not present a threat to any roadway embankments.

Comment Summary: Any construction work done on Alabama Highway Department Right-of-Way should be coordinated with Mr. Cecil E. Snipes, Division Engineer, Sheffield, Alabama.

Response: Noted.

Bob Truett, Birmingham, Alabama

Comment Summary: Channel work destroys streambeds, lowers water tables, increases siltation, damages wildlife populations, and increases flooding downstream.

Response: The effects to the environment of the planned channel work is fully described in the ENVIRONMENTAL IMPACT section.

Comment Summary: Economically this project is a disaster. Benefits of the project will never equal the cost.

Response: Economic evaluation procedures utilized are in accordance with those developed by the U. S. Department of Agriculture. Much of the information was obtained from local residents who experience the effects of flooding. Benefits to be realized from the project are described in Part I, BENEFITS-MONETARY section and Part II, ENVIRONMENTAL IMPACT section.

Comment Summary: The only valid benefit listed for this project is vector control.

Response: Vector control is an important benefit from the works of improvement.

LIST OF APPENDICES

APPENDIX A - Comparison of Benefits and Costs for Structural Measures

APPENDIX B - Project Map

APPENDIX C - Letters of Comment Received on Draft Statement

APPENDIX D - Soils Map

APPENDIX D-1- Land Capability Classes and Subclasses

APPENDIX E - Land Use Map

APPENDIX F - Archaeological Data

APPENDIX G - References Cited

APPROVED BY W B Lingle DATE APR 9 1976

W. B. Lingle
State Conservationist

APPENDIX A - COMPARISON OF BENEFITS AND COSTS

Mud Creek Watershed, Alabama
(Dollars)

EVALUATION UNIT	AVERAGE ANNUAL BENEFITS 1/							TOTAL	AVERAGE ANNUAL 3/ COST	BENEFIT-COST RATIO
	DAMAGE REDUCTION	MORE INTENSIVE LAND USE	CHANGED AGR.	LAND USE URBAN	REDEVELOP-MENT	VECTOR CONTROL	SECOND-ARY			
Channel Work	7,300	3,300	3,000	2,100	4,600	4,500	2,100	26,900	18,000	1.5:1.0
Project Administration									2,200	
GRAND TOTAL	7,300 2/	3,300	3,000	2,100	4,600	4,500	2,100	26,900	20,200	1.3:1.0

1/ Price base: crop and pasture benefits current normalized prices (October 1975), other benefits 1975 prices.
2/ In addition, it is estimated that land treatment measures will provide flood damage reduction benefits of $300 annually.
3/ Amortized for 100-years at 5 7/8 percent interest.

March 1976

U.S. DEPARTMENT OF AGRICULTURE

SOIL CONSERVATION SERVICE, AUBURN, ALABAMA

VICINITY MAP

34°05'—

34°02'30"—

86°47'30"

86°45'

To Decatur

To Center Hill

LOUSVILLE

HANCEVILLE

Lat. No. 2

10+00

38+00

132+00

141+00

175+00

186+00

39+00

67+20

74+08

80+50

258+60

275+80

242+00

To Sewage Treatment Plant

Evaluation Reach III

Evaluation Reach I

STOUT MTN ROAD

NIGG ROAD

NASHVILLE ROAD

RAILROAD

MUD CREEK

MT. LIBERTY FORK OF BLACK WARRIOR RIVER

To I-65

To Birmingham

31

3

91

N

LEGEND

- 31 Federal Highway
- 91 State Highway
- Railroad
- Drainage
- Watershed Boundary
- Channel Work
- Area Benefited

SOURCE: Project map developed by Soil Conservation Service.

Appendix B

PROJECT MAP

MUD CREEK WATERSHED

CULLMAN COUNTY, ALABAMA

0 1 2

APPROXIMATE SCALE - MILES

POLYCONIC PROJECTION COMPILED AND REPRODUCED AT 1:31,680 (2 INCHES EQUALS 1 MILE).

BASE COMPILED FROM LATEST USGS QUADRANGLE SHEETS.

REVISED MAY 1975 4-R-29819

APRIL 1976 BASE 4-R-31370

APPENDIX C

Letters of Comment Received on Draft Environmental Impact Statement

24 FEB 1976

Honorable Robert W. Long
Assistant Secretary of Agriculture
Washington, D. C. 20250

Dear Mr. Long:

In compliance with the provisions of Section 5 of Public Law 566, 83d Congress, the State Conservationist of Alabama by letter of 5 December 1975, requested the views of the Chief of Engineers on the combined draft watershed plan and Environmental Impact Statement for the Mud Creek Watershed, Alabama.

The draft environmental statement satisfies the requirements of Public Law 91-190, 91st Congress, insofar as this Department is concerned. The findings of the work plan do not conflict with any projects or proposals of this Department.

The Alabama State Conservationist should be informed that regulatory permits will be required for work that affects navigable waters and requests for such permits should be made to the Mobile District Office of the Corps of Engineers at the earliest possible date.

Sincerely,

(Signed) Charles R. Ford

Incl

Charles R. Ford
Deputy Assistant Secretary of the Army
(Civil Works)

bc:
W. E. Lingle, SCS, Auburn, Alabama

UNITED STATES DEPARTMENT OF COMMERCE
The Assistant Secretary for Science and Technolo
Washington, D.C. 20230

February 2, 1976

Mr. W. B. Lingle
State Conservationist
Soil Conservation Service
Department of Agriculture
P. O. Box 311
Auburn, Alabama 36830

Dear Mr. Lingle:

This is in reference to your draft environmental impact statement entitled "Mud Creek Watershed." The enclosed comments from the National Oceanic and Atmospheric Administration are forwarded for your consideration.

Thank you for giving us an opportunity to provide these comments, which we hope will be of assistance to you. We would appreciate receiving four (4) copies of the final statement.

Sincerely,

Sidney R. Galler

Sidney R. Galler
Deputy Assistant Secretary
for Environmental Affairs

Enclosure - Memo from Environmental Data Service, January 9, 1976

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
ENVIRONMENTAL DATA SERVICE
Washington, D.C. 20235

JAN 14 1976

January 9, 1976 Dx61/DLEC

TO: William Aron
Director, Office of Ecology and Environmental Conservation, EE

FROM: Evelyn LeLonte for
Lewis A. Pitt
Special Projects

SUBJECT: EDS Review of DEIS 7512.18 (Mud Creek Watershed)

The EDS has reviewed the subject DEIS and offers the following comments:

Since flood prevention is a major goal of the project, the climate description would be enhanced by including information on flood-producing weather systems. The frequency, duration, and type of storm which produces flooding should be indicated, as well as the time of year such storms occur. Extreme rainfall amounts should also be included. Frequency and duration data are found in U.S. Weather Bureau Technical Paper No. 40. This and other climate information is available from the National Climatic Center, Asheville, N.C. 28801.

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
BIRMINGHAM AREA OFFICE
DANIEL BUILDING, 15 SOUTH 20TH. STREET, BIRMINGHAM, ALABAMA 35233

December 17, 1975

REGION IV
Peachtree-Seventh Building
50 Seventh Street, N.E.
Atlanta, Georgia 30323

IN REPLY REFER

4.2SS

Mr. W. B. Lingle
State Conservationist
Soil Conservation Service
U. S. Department of Agriculture
Post Office Box 311
Auburn, Alabama 36830

Dear Mr. Lingle:

Subject: Draft Watershed Plan and Environmental Impact Statement
Mud Creek Watershed
Cullman County, Alabama
HUD No. 279

We are pleased to acknowledge receipt of the above referenced request for HUD comment under the requirements of the National Environmental Policy Act of 1969 (PL 91-109).

We have reviewed the information submitted with your referral and, to the extent of our available staff resources, have investigated the environmental impact, adverse effects, alternatives, short term and long term uses of the local environment and the commitment of resources which the project involves. From the information available to us, we found no basis for formal comment because of special HUD interests or expertise.

If further clarification of this matter is needed, please contact me at 254-1619.

Sincerely,

Robert E. Lunsford
Environmental Officer

United States Department of the Interior

OFFICE OF THE SECRETARY
WASHINGTON, D.C. 20240

PEP ER-75/1174

FEB 9 1976

Dear Mr. Lingle:

Thank you for the letter of December 5, 1975, requesting our views and comments on the combined draft plan and draft environmental statement for Mud Creek Watershed, Cullman County, Alabama. We have reviewed the documents and conclude that they adequately consider those areas within our jurisdiction and expertise, except for several suggestions offered below.

It is stated on page II-20, paragraph 3, that the proposed project should not alter a 25 acre wetland area adjacent to the main channel. However, the construction practices to be utilized in this area are never fully disclosed and the maintenance of this wetland is not fully explained. This should be clarified.

Although the environmental statement recognizes that "flooding occurs frequently because of insufficient outlets and low stream capacities" (page II-27, paragraph 3), the storm frequency and resulting depth of flooding occurring in the project area should be assessed.

The only recently recorded mineral production of economic significance in Cullman County is for coal. Available information indicates that the area's coal reserves are limited to the higher elevations and that no significant minerals are known to occur in the immediate watershed area. Unless onsite studies indicate otherwise, we recommend that a statement to this effect be included under Mineral and Ground Water Resources, first paragraph on page II-31.

In view of frequent flooding of the Hanceville sewage treatment plant, resulting in raw sewage overflows to enter Mud Creek (page II-29, paragraph 3), flood protection measures for the plant site should be considered in order to minimize water quality problems in the surface water regime.

Mitigating measures (pages II-22 and II-70) are planned to prevent the contamination of wells and springs from necessary project related sanitary facilities and to avoid cutting into "recognized aquifers" during channel work. We suggest that the statement should also address the matter of any changes in point(s) of effluence as a result of the channel work and consider attendant water level and groundwater discharge effects. The character of flow in Mud Creek, progressively ephemeral, intermittent, and perennial downstream, suggests the importance of groundwater discharge through valley bottom or flood plain deposits, although their significance for groundwater is not mentioned; therefore, channel deepening or alteration may chang points of effluence. The statement also should indicate any impacts of the proposed drainage ditches on groundwater resourc

We hope these comments will be of assistance to you in the preparation of the final statement.

Sincerely yours,

Deputy Assistant Secretary of the Interior

Mr. W. B. Lingle
State Conservationist
Soil Conservation Service
Department of Agriculture
Post Office Box 311
Auburn, Alabama 36830

DEPARTMENT OF TRANSPORTATION
UNITED STATES COAST GUARD

MAILING ADDRESS:
U.S. COAST GUARD (G-WS/73)
WASHINGTON, D.C. 20590
PHONE (202) 426-2262

3 FEB 1976

Mr. W. B. Lingle
State Conservationist
Soil Conservation Service
P. O. Box 311
Auburn, Alabama 36830

Dear Mr. Lingle:

This is in response to your letter of 5 December 1975 addressed to the Commandant, U. S. Coast Guard concerning a draft environmental impact statement for the Mud Creek Watershed, Cullman County, Alabama.

The Department of Transportation has reviewed the material submitted. We have no comments to offer nor do we have any objection to this project.

The opportunity to review this draft statement is appreciated.

Sincerely,

D. J. RILEY
Captain, U. S. Coast Guard
Deputy Chief, Office of Marine
Environment and Systems
By direction of the Commandant

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

1421 PEACHTREE ST., N. E.
ATLANTA, GEORGIA 30309

February 5,1976

Mr. W. B. Lingle
State Conservationist
U. S. Department of Agriculture
Soil Conservation Service
P. O. Box 311
Auburn, Alabama 36830

Dear Mr. Lingle:

We have reviewed the Draft Environmental Impact Statement for Mud Creek Watershed in Cullman County, Alabama and believe it could be improved by delineating the additional adverse effects of channelization.

It is noted that the project includes 4.7 miles of channel work which is justified primarily for its value in protecting cropland along the stream, the Hanceville sewage treatment plant, and a small urban area in Hanceville. In order that a true evaluation be given for the project, it should be acknowledged that channelization has several additional adverse environmental effects relating to water quality.

Trees and shrubs along the Mud Creek are being removed for construction of the channel, resulting in a loss of 69 acres of floodplain forest, and an additional 72 acres are made available for agricultural use. By eliminating trees and shrubs along the stream, water temperatures are increased and this has the greatest adverse effect during hot dry periods when the flow is low.

In addition, the increase in water temperature reduces its assimilative capacity for oxygen and therefore its ability to reduce or oxidize pollutants.

Therefore, under "Adverse Environmental Impacts" (page 11-75) the following should be added:

(6) Stream temperatures will be increased and DO values will be less.

(7) The assimilative capacity of the stream for absorbing wastes will be less and pollutional loads will be carried farther downstream before being assimilated.

In another area of concern, any construction involving the sewage treatment plant should be in accordance with Alabama Water Improvement Commission procedures and have their approval. These procedures should be identified in the environmental impact statement.

Finally, if open burning is to be carried out, it must be done in accordance with State and local regulations. Therefore, a section should be included stating that appropriate measures will be taken to comply with State and local regulations.

In view of the foregoing, we have rated LO- (lack of objections) to the impact of the action and 2- (insufficient information) to the impact statement.

Please furnish us with five copies of the final statement, and if we can be of further assistance in any way, please let us know.

Sincerely,

John E. Hagan III

John E. Hagan, III
Chief, EIS Branch

ALABAMA STATE SOIL AND WATER CONSERVATION COMMIT

ROOM 203 RICHARD BEARD BUILDING
1445 FEDERAL DRIVE
P. O. BOX 3336
MONTGOMERY, ALABAMA 36109

December 17, 1975

WILBUR B. NOLEN, JR.
EXECUTIVE SECRETARY

STATE COMMITTEE MEMBERS

A. D. HOLMES, JR.
DISTRICT SUPERVISOR

JOE HAMILTON
DISTRICT SUPERVISOR

JOE TRAYLOR
DISTRICT SUPERVISOR

E. P. GRANT, JR.
DISTRICT SUPERVISOR

LEWEL SELLERS
DISTRICT SUPERVISOR

RAY VANDIVER
DISTRICT SUPERVISOR

HOWARD W GREEN
STATE SUPERVISOR
VOCATIONAL AGRICULTURE

DR R DENNIS ROUSE
DEAN OF AGRICULTURE

RALPH R. JONES
DIRECTOR
EXTENSION SERVICE

Mr. W. B. Lingle, State Conservationist
Soil Conservation Service
P. O. Box 311
Auburn, Alabama 36830

Dear Mr. Lingle:

The State Soil and Water Conservation Committee has reviewed the proposed "combined draft watershed plan and environmental impact statement" for the Mud Creek Watershed located in Cullman County, Alabama, and finds same to be in proper order. The application for assistance in preparation of this plan was approved by the Committee on September 25, 1969.

The State Committee unanimously concurs with the local sponsors in their view that this proposed development is definitely needed and, furthermore, that it will enhance rather than degrade the project area environment.

Anything that you or the Soil Conservation Service Administrator can do to expedite this proposal will be greatly appreciated, by both the Sponsors and the State Committee.

Very truly yours,

WILBUR B. NOLEN, JR.
EXECUTIVE SECRETARY

WBN:msh

State of Alabama
Department of Public Health
State Office Building
Montgomery, Alabama 36130

RA L. MYERS, M. D.
TATE HEALTH OFFICER

January 2, 1976

Mr. W. B. Lingle
State Conservationist
United States Department of Agriculture
Soil Conservation Service
P. O. Box 311
Auburn, Alabama 36830

Dear Mr. Lingle:

My staff in the Division of General Sanitation has carefully reviewed the Draft Plan and Draft Environmental Statement for the Mud Creek Watershed project proposed to be located in Cullman County, Alabama and find that we have no adverse comments to make in connection with the project provided that the construction of drainage ditches and discharge waters from these ditches does not affect the proper functioning of sewage disposal systems within the area. We believe that proper drainage can be very effective in relieving many of the problems currently being experienced in the way of flooding at the Hanceville sewage treatment plant.

If we can be of further service to you, please let us know.

Sincerely yours,

W. T. Willis

W. T. Willis, Director
Environmental Health Administration

WTW/ml

STATE OF ALABAMA
HIGHWAY DEPARTMENT

MONTGOMERY, ALABAMA 36104
December 8, 1975

RAY D. BASS
HIGHWAY DIRECTOR

Mr. W. B. Lingle, State Conservationist
Soil Conservation Service
U. S. Department of Agriculture
P. O. Box 311
Auburn, Alabama 36830

RE: Mud Creek Watershed
Cullman County, Alabama

Dear Mr. Lingle:

We have reviewed the Draft Environmental Impact Statement for the above project and have no objections.

However, if the proposed channel change should create a potential threat to existing roadway embankments at Alabama 91 and U. S. 31, it is requested that appropriate embankment protection measures be applied. Also, any construction work done on Alabama Highway Department Right-Of-Way should be coordinated with Mr. Cecil E. Snipes, Division Engineer, P.O. Box 896, Sheffield, Alabama 35660 (Telephone: 828-2461), prior to construction.

We appreciate the opportunity to comment on this project.

Sincerely,

J. F. Freeman, Engineer
Bureau of Surveys and Plans

JFF/dbw

cc: Mr. Paul G. Stough
File

2630 Cahaba Road
Birmingham, Alabama 35223
December 9, 1975

Mr. W. B. Lingle
U.S. Dept. of Agriculture
P. O. Box 311
Auburn, Alabama 36830

Dear Mr. Lingle:

Please enter the following comments into the records concerning the Mud Creek Watershed project in Cullman County, Alabama.

I have carefully studied the Draft Plan and the Environmental Impact Statement on this project and I must protest as vigorously as possible the waste of public funds and the environmental destruction which this plan represents.

The project consists mostly of stream channelization. Every conservationist who knows anything whatsoever about our environment knows that channelization is one of the most destructive and worthless proceedures ever devised for any purpose. It destroys stream beds, lowers water tables, increases siltation, damages wildlife populations, and increases flooding problems farther down stream. Flood areas around small streams are exactly that. They are designed by nature to accommodate excess water. They are supposed to flood occasionally. Man's folly is building things which are not designed to withstand flooding in these flood areas. He then compounds that folly with imbecilic projects like stream channelization which accomplish nothing except to dump the problem on someone else farther downstream.

Economically this project is a disaster. The only reason the federal government is always involved in projects like this is because no sane financier would lend even a fraction of the money required by this project. It is patently obvious that the questionable benefits of the project will never come close to equalling the cost, deliberately contrived and misleading cost/benefit ratios notwithstanding.

The only valid benefit listed for this project is vector control to be accomplished by the drainage of a small pond near Hanceville. Such small ponds are also the habitats of a multitude of small species of creatures which officialdom generally considers to be worthless (no obvious economic value.) Such species are not worthless to people who understand nature and so should not be dismissed as unimportant in all projects. However when such a pond is a nuisance in an urban area such as Hanceville the value of eliminating the nuisance is greater than the biological loss involved. Therefore only this part of the project should be done. It can be done, however, at a tiny fraction of the cost of the entire project.

It is said that there are three kinds of lies. I find that there are four: white lies, damnable lies, misused statistics and cost/benefit ratios prepared by federal bureaucrats.

When will this nation get a leader who will put a stop to the waste of tax dollars on destructive projects such as the Mud Creek Watershed Project?

Naturally yours,

Bob Truett

Bob Truett

FBT/lh

cc: Jim Allen, Senator
Senator John Sparkman
Congressman John Buchanan

U.S. DEPARTMENT OF AGRICULTURE

SOIL CONSERVATION SERVICE, AUBURN, ALABAMA

34°05′

34°02′30″

86°47′30″

86°45′

ALABAMA

VICINITY MAP

HANCEVILLE

Mud Creek

Little Mud Creek

Sandy Creek

Big Stout Mtn.

Stout Mtn. Road

Old Hwy 91

Cullman

Blountsville

Smith Lake

Mulberry Fork of Black Warrior River

LEGEND

- 31 Federal Highway
- 91 State Highway
- Railroad
- Drainage
- Watershed Boundary

SOIL ASSOCIATION

- 1 ALBERTVILLE-ENDERS association
- 2 MONTEVALLO association
- HARTSELLS-LINKER association
- 4 TAFT-ROANOKE-CHEWACLA association

SOURCE: Soil association map developed from the published Soil Survey Report for Cullman County, Alabama.

Appendix D

SOIL ASSOCIATION MAP

MUD CREEK WATERSHED

CULLMAN COUNTY, ALABAMA

0 1 2

APPROXIMATE SCALE · MILES

POLYCONIC PROJECTION COMPILED AND REPRODUCED AT 1:31,680 (2 INCHES EQUALS 1 MILE).

BASE COMPILED FROM LATEST USGS QUADRANGLE SHEETS.

MAY 1975 4-R-34927

APRIL 1975 BASE 4-R-34370

APPENDIX D-1

LAND CAPABILITY CLASSES AND SUBCLASSES

Capability grouping shows, in a general way, the suitability of soils for most kinds of field crops. The soils are grouped according to their limitations when they are used for field crops, the risk of damage when they are used, and the way they respond to treatment. The grouping does not take into account major and generally expensive landforming that would change slope, depth, or other characteristics of the soils; does not take into consideration possible but unlikely major reclamation projects; and does not apply to rice, cranberries, horticultural crops, or other crops that require special management. This classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for range, for forest trees, or for engineering purposes. The capability classes and subclasses are defined in the following paragraphs.

CAPABILITY CLASSES, the broadest groups, are designated by Roman numerals I through VIII. The numerals indicate progressively greater limitations and narrower choices for practical use, defined as follows:

Class I soils have few limitations that restrict their use.

Class II soils have moderate limitations that reduce the choice of plants or require moderate conservation practices.

Class III soils have severe limitations that reduce the choice of plants, require special conservation practices, or both.

Class IV soils have very severe limitations that reduce the choice of plants, require very careful management, or both.

Class V soils are not likely to erode but have other limitations, impractical to remove, that limit their use.

Class VI soils have severe limitations that make them generally unsuitable for cultivation.

Class VII soils have very severe limitations that make them unsuitable for cultivation.

Class VIII soils and landforms have limitations that nearly preclude their use for commercial plants.

CAPABILITY SUBCLASSES are soil groups within one class; they are designated by adding a small letter, e, w, s, or c, to the class numeral, for example, IIe. The letter e shows that the main limitation is risk of erosion unless close-growing plant cover is maintained; w shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); s shows that the soil is limited mainly because it is shallow, droughty or stony; and c, used in only some parts of the United States, shows that the chief limitation is climate that is too cold or too dry.

In Class I there are no subclasses, because the soils of this class have few limitations. Class V contains only the subclasses indicated by w, s, or c, because the soils in Class V are subject to little or no erosion, though they have other limitations that restrict their use to pasture, range, woodland, wildlife habitat, or recreation.

U.S. DEPARTMENT OF AGRICULTURE

SOIL CONSERVATION SERVICE, AUBURN, ALABAMA

34° 05′

34° 02′ 30″

86° 47′ 30″

86° 45′

VICINITY MAP

HANCEVILLE

MILLERS FORK OF BLACK WARRIOR RIVER

LEGEND

- (31) Federal Highway
- (91) State Highway
- Railroad
- Drainage
- Watershed Boundary

LEGEND

- Forest Land
- Pastureland
- Urban Land
- Cropland

SOURCE: Land use map developed by Soil Conservation Service.

Appendix E

LAND USE MAP
MUD CREEK WATERSHED
CULLMAN COUNTY, ALABAMA

0 1 2

APPROXIMATE SCALE - MILES

POLYCONIC PROJECTION COMPILED AND REPRODUCED AT 1:31,680 (2 INCHES EQUALS 1 MILE).

BASE COMPILED FROM LATEST USGS QUADRANGLE SHEETS.

MAY 1975 4-IC-34926

APRIL 1975 BASE 4-IC-34370

APPENDIX F

ARCHAEOLOGICAL DATA

An archaeological survey was conducted and a report prepared under a contractual agreement between the University of Alabama and the USDA, Soil Conservation Service, with David L. DeJarnette, associate professor of anthropology at the University of Alabama and curator of Mound State Monument, serving as project director. Field Supervisor was John W. O'Hear, graduate student in anthropology at the University of Alabama.

Following is a reprint of the "Summary and Conclusions" and associated map from the report.

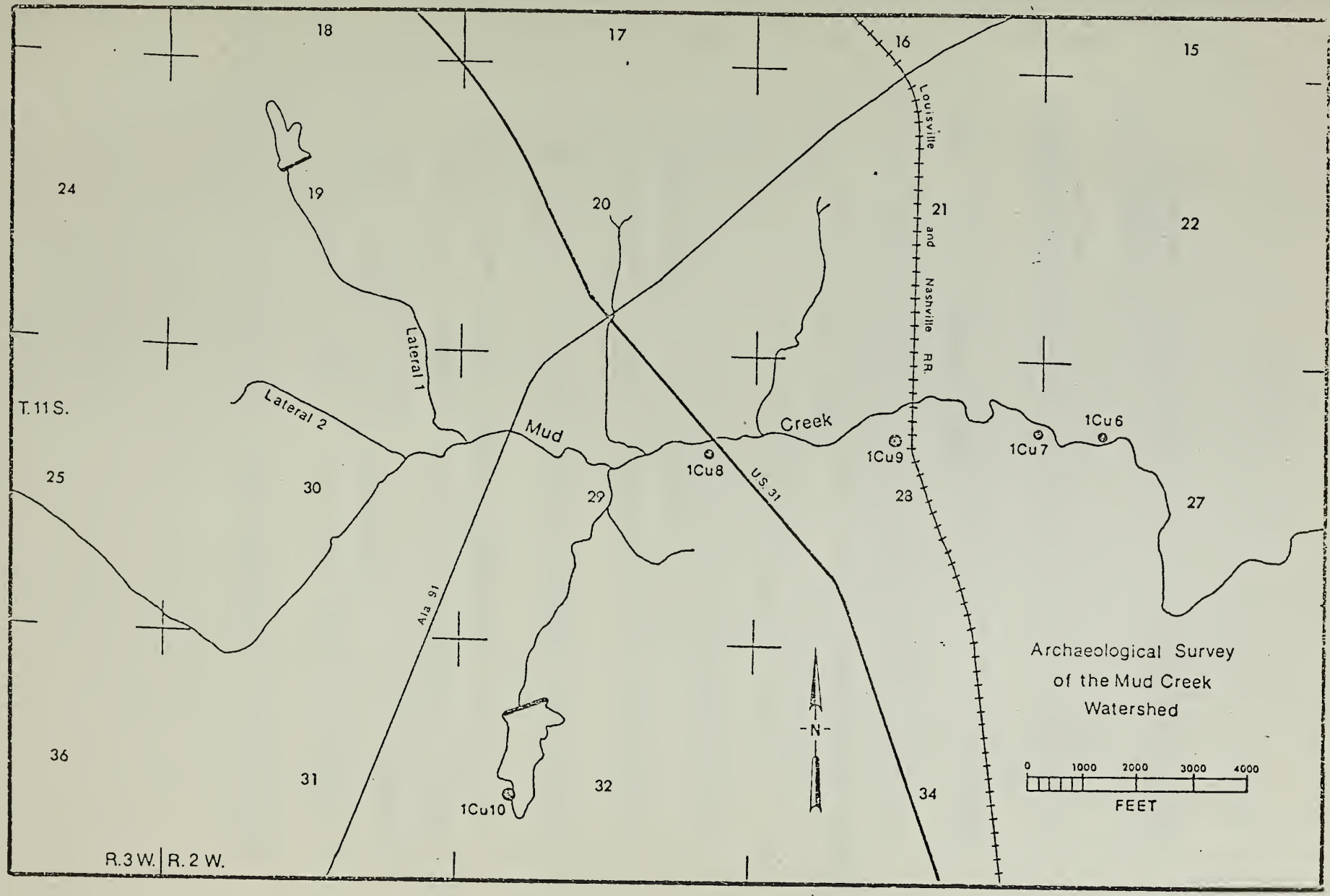
Summary and Conclusions

The Mud Creek area appears to have been sporadically visited by American Indian groups from approximately 4000 B. C. to 900 A. D. The sites preferred for occupation by aboriginal groups are areas which are well drained and on the second terrace of the creek.

The most extensive occupation of the sites appears to have been during the Archaic Period. These peoples probably moved into the smaller tributaries from more permanent settlements along the main river. This

move would have enabled them to exploit the locally available food resources. The almost complete lack of ceramics on sites located during this survey would indicate that post-Archaic occupation was very light. The single potsherd found at Site 1Cu6 would indicate a Late Woodland occupation of some sort, with an earlier Archaic occupation suggested by projectile points also found on the site. The presence of seed processing implements (nutstones, mortars, and mullers) recovered from three of the sites would suggest that the gathering of nuts such as acorns or hickories was one of the activities carried out in this area. Shellfish gathering, as evidenced by the bivalve fragments from 1Cu6, was probably of less importance. Hunting was probably of primary importance due to the relatively large number of cutting and scraping implements and projectile points found.

Of the five sites located during the survey, Sites 1Cu6 and 1Cu9 are worthy of further investigation. However, both of these sites are located outside of the areas that will be affected by the proposed project. The remaining three sites, 1Cu7, 1Cu8, and 1Cu10, have been so badly disturbed by plowing and erosion that they do not warrant any further investigation.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Louisville and Nashville RR.
Lateral 1
Lateral 2
T. 11 S.
Mud Creek
1Cu6
1Cu9
1Cu7
1Cu8
U.S. 31
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Ala 91
Archaeological Survey of the Mud Creek Watershed
N
0 1000 2000 3000 4000
FEET
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34
1Cu10
R. 3 W. | R. 2 W.

Fig. 1

APPENDIX G

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